HF WIDEBAND RECEIVER

TYPE RA. 6217E

OPERATING AND MAINTENANCE INSTRUCTIONS

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RA.6217E

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1. GENERAL

A. The RA. 6217E model Receiver is a modification of the 'A' model Receiver which is designed to automatically tune Racal's RA. 6397A Antenna Preselector. The Preselector is designed for use in front of the RA. 6217 series Receivers where manual antenna tuning is not utilized. The Preselector consists of a bank of 21 filters, 19 of which are approximately 1 MHz in bandwidth; the other two being each approximately 5 MHz in bandwidth. The 19 are center tuned to 1.5, 2.5, ... , 19.5 respectively; the two others tune 20 - 25 and 25 - 30 MHz respectively. Selection of a particular filter is accomplished by means of reed relays actuated by DC voltages. Tuning control is obtained from outside the Preselector box - in this case from the RA.6217E - by application of minus 16 volts and grounds to control lines which connect to the relays via cabling.

B. The RA. 6217 series Receivers are tuned in 1 MHz band-tuning steps by means of the Receiver front panel MHz control. The RA. 6217E MHz control includes a special gear and switch arrangement which applies -16 volts and grounds to the RA.6397A control lines. Thus, the RA. 6397A is controlled from the Receiver and tunes along in step with the Receiver.

This tuning control is achieved by adding a thirty position, two-section switch (ref. C-03340B) to the Receiver MHz tuning control. This switch is mechanically driven by gearing added to the tuning shaft so that the negative voltage and grounds are switched to the proper lines. The thirty positions agree with the possible MHz tuning positions - 00 through 29. The switch positions connect to the RA. 6397A filters via control line filter assembly, A-03318, located in rear of Receiver chassis; J3401, Receiver rear panel connector; and J201, located on rear of the RA. 6397A.

The control line filter assembly serves to eliminate spurious signals which might result from noise pick-up by the unshielded control line cable.

C. A further variation on the 'A' model included in the 'E' model is that, in addition to the standard IF bandwidths - 0.2, 1, 3, 6, and 13 KHz - a 75 KHz bandwidth at 1.6 MHz is available out of the Receiver via J113 located on the Receiver's rear panel. Thus, 1.6 MHz wide bandwidth signal is useful when the Receiver is operated with the Racal RA. 6366 or RA. 6367 model panoramic display unit(s). To obtain this wider bandwidth, a third mixer

module different from the 'A' Receiver mixer is used in the 'E' model Receiver. The 1.6 MHz WIDE OUTPUT is available directly out of the Receiver via J113 and is independent of the IF BW control setting (front panel).

D. In all other respects the 'E' model Receiver is the same as the 'A' model and the 'A' model Instruction book will apply. In the following sections, the 'E' model schematics and assembly numbers are listed along with the 'A' model numbers which are included in the book, but which do not apply to the 'E' model. Also following is an 'E' model parts list to serve as a correction to that list included in the 'A' model book.

2. SCHEMATICS AND ASSEMBLY NUMBER SCHEDULE FOR RA.6217E

ASSEMBLY	PERTINENT	NOT PERTINENT
a. Schematics:		
Main Chassis	G-03348A	G-01310
Control Switch/Filter	C-03340B	--
Third Mixer	G-02291	G-01302
b. Assembly No:		
Main Chassis	A-3304B	A-02086-1
Control Filter	A-03318-2D	--
Third Mixer	A-02290	A-01323

3. RA. 6217E PARTS LIST AND CHANGES TO RA. 6217A LIST

A. Main Chassis - Series 100:

Same as RA, 6217A except add:

1) J113 BNC Connector UG 1094/u
2) Switch RCI P/N B-03306
3) Filter RCI P/N A-03318-2D including:
   1) J3401 connector, RCI P/N A-02000-2
   2) C1 thru C28 Capacitor, 1000 pf, A-B number SS5A
   3) L1 thru L4 Choke, 680 uH, Miller number 9220-20

B. 1. Schematic Schedule for the RA. 6217E

a. Same as RA.6217A except that:

'A' Model Schematics NOT Pertinent

G-01310 Main Chassis
G-01302 Third Mixer

b. 'E' Model Schematics Included as Amendment

G-03348A Main Chassis (also ref. C-03340B)
G-02291 Third Mixer

C. Parts List for RA. 6217E

1. Main Chassis - Series 100 - Same as RA. 6217A except for:

a. Add J113 - 1.6 MHz Wide Output Connector (rear apron) - BNC UG 1094/u.

b. 30 position Switch - RCI Type B-03306

c. Control Line Filter - RCI Type A-03318
The Control Line Filter consists of the following:

1. J3401 Connector - RCI Type A-02900-2
2. C1 thru L14 Choke, 680uH, Miller #9220-20

2. Third Mixer - Series 900 - for the RA. 6217E is same as that for the RA. 6217A with the addition of the following assembly items:

Resistors:

R18, Fxd. Comp., 68 ohm, 5%, 1/4W, RC07GF680J
R19, Fxd. Comp., 4.7K ohm, 5%, 1/4W RC07GF472J
R20, Fxd. Comp., 2.2K ohm, 5%, 1/4W, RC07GF472J
R21, Fxd. Comp., 33K ohm, 5%, 1/4W, RC07GF333J
R22, Fxd. Comp., 39 ohm, 5%, 1/4W, RC07GF390J
R23, Fxd. Comp., 680 ohm, 5%, 1/4W, RC07GF681J
R24, Fxd. Comp., 8.2K ohm, 5%, 1/4W, RC07GF822J
R25, Fxd. Comp., 15K ohm, 5%, 14/W, RC07GF153J
R26, Fxd. Comp., 4.7K ohm, 5%, 1/4W, RC07GF472J
R27, Fxd. Comp., 51 ohm, 5%, 1/4W, RC07GF510J
R28, Fxd. Comp., 1K ohm, 5%, 1/4W, RC07GF102J
R29, Fxd. Comp., 51 ohm, 5%, 1/4W, RC07GF510J
R30, Fxd. Comp., 57K ohm, 5%, 1/4W, RC07GF573J
R31, Fxd. Comp., 12K ohm, 5%, 1/4W, RC07GF123J

Capacitors:

C19, Electrolytic, 50ug, 25V, Sprague TE-1209
C20, Ceramic, 0.1uf, 20%, 25V, Sprague Monolythic 5C7
C21, Same as C20
C22, Fxd. Mica, 120pf, 1%, 300V, CD6F121G300
C23, Fxd. Mica, 560pf, 2%, 100V, CD7F561G100
C24, Same as C20
C25, Same as C20
C26, Same as C20
C27, Same as C20
C28, Fxd. Mica, 390pf, 2% 100V, CD7F391G100
C29, Ceramic, 3300pf, 20% 50V, Erie 8131-026X5U0332M
C30, Same as C29
C31, Same as C20

Inductors:

L9, Coil Assembly, Variable, 100uhy, Nytronics WEE V-L
L10, Coil Assembly, Variable, 3.9uhy, Nytronics WEE V-L

Transistors:

Q4, 2N3323
Q5, 2N3323
Q6, 2N3323

RA. 6217 H.F. RECEIVER

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CHAPTER 1

General Description

The communications receiver type RA. 6217 has been designed for use as a general purpose receiver to provide a high order of selectivity and stability. The receiver covers a frequency range from 980 kc to 30 mc with continuous tuning via electronic bandswitching. The internal crystal controlled oscillator provides calibration markers at each 100 kc interval to facilitate checking of the 2nd VFO and digital readout frequencies.

The receiver is designed to operate -- at the customer's option-- from any one of the following power sources:

1. Standard AC sources, 100-125 or 200-250 volts, 48-420 cps. - MA. 6302

2. Nickel cadmium battery pack. - MA 6704

3. A DC to DC converter which can be switched for either a 12 or 24 volt DC system with either line grounded. - MA 6301

4. Standard AC source with nickel cadmium battery charging facilities. - MA. 6300

Construction Details

The RA. 6217 features continuous tuning via electronic band-switching which eliminates switches, complex wiring and involved mechanical tracking mechanisms. The complete absence of switch contacts in frequency determining circuits contributes to the stability, reliability and speed of operation while sensitivity and setting accuracy are essentially constant over the entire tuning range.

The RA. 6217 is available from factory for use in remote tuning applications. Such models are known as RA. 6217D Series Receivers.

The Receiver described in this book is known as the RA. 6217A or RA. 6217 Model Receiver.

TECHNICAL SPECIFICATIONS

Frequency Range:	980 kc - 30 mc, can be extended down to 3 kc with LF Converter, RA. 337
Reception Modes:	AM, FM, MCW, CW, SSB
Tuning:	Digital 'Readout' in Mc and Kc with interpolation at 200 cps intervals
Frequency Setting Accuracy:	Within 250 cps, with an oscillator output for a digital counter available.
Antenna Input:	75 ohms wideband or double tuned in 5 bands, with VSWR 2:1 or better
Sensitivity: (3 kc bandwidth)	CW, SSB, 0.5 u/volt for 15 db S/N ratio MCW, AM (30% mod) 1.5 u/volt for 15 db S/N ratio
Sensitivity: (13 kc bandwidth)	FM (±6 kc deviation) 1 u/volt for 10 milliwatt AF output
Stability:	a. Long Term: 50 cps per 8 hour period at ambient temperature b. Short Term: 5 cps at ambient temperature c. Variation with Temperature: Less than 50 cps per ^{o}C
Stability: (Ext. Control)	Facilities are provided to enable injection of external synthesizer or external standard oscillators, also master/slave operation in diversity systems. Stability determined by System Standard Employed.
Calibration:	Internal calibration oscillator provides markers at 100 kc intervals

Selectivity:	13, 6.0, 3.0, 1.0kc/s and 200 cps, 3 db points ±15% center frequency. 13 kc is replaced with 20 kc bandwidth in the RA. 6217C model.
Shape Factor (6 - 60 db):	1:4 or better, 1:10 or better for 200 cps bandwidth
I. F. Outputs:	a. 2-3 mc output for Pan. Display Unit RA. 6366/RA. 6367. b. 1.6 mc - 100 mv nom. to 75 ohms after IF selectivity. c. 455 kc - 200 mv nom. to 50 ohm is standard. (100 kc - 100 mv nom. to 50 ohm is optional - ref. RA. 6217A-2.)
Noise Figure:	Less than 10 db throughout
AGC:	a. Input variation from 3 to 30,000 microvolts causes no more than 3 db change in output level b. Time Constants (nominal): Short Charge, 16 milliseconds, discharge 30 milliseconds Medium Charge, 50 milliseconds, discharge 200 milliseconds Long Charge, 80 milliseconds, discharge 4 seconds
BFO Range:	± 8 kc, (variable) with fixed crystal control points at ±1.5 kc, coarse and fine control facilities
Meter Indication:	a. "S" scale (db ref 1 microvolt) b. AF level to line - RA.6217A; or Voltage (MA6704) - RA. 6217C.
AF Output:	a. 10 milliwatts to headphone jack and rear terminals, 600 ohms b. Independent 1.0 milliwatt output to rear terminal, 600 ohms

AF Response (overall):	To correspond with I. F. bandwidth in use and maintained to within 3 db at 100 cps. Optional bass cut at 300 cps
AF Distortion (overall):	Less than 2%
RF Input Attenuator:	0 to 40 db nominal in 10 db steps - RA. 6217A; 0-60 db for RA. 6217C.
Spurious Response to External Signal:	Better than 60 db down for signals less than 10% off tune -- better than 80 db for signals more than 10% off tune
Internally Generated Spurious Signals:	Below noise when measured with a 3 kc bandwidth except at 1.0 mc where response can be 5 db above receiver noise
Image Rejection:	80 db or better
Inband Intermodulation Distortion Products:	40 db below two desired - 15 dbm input signals within the receiver passband
Out of Band Intermodulation Distortion Products (Second Order) with Tuned Input:	-90 db or better
Cross Modulation:	For levels of wanted signal between 5 microvolts and 1.0 millivolt, an interferring signal 1.33% removed and modulated 30% must have a level at least 46 db greater than the wanted signal to produce a cross modulation of 3%. The ratio is improved up to 10% off tune at the rate of approximately 2 db per %
Oscillator Radiation at Antenna Terminal:	Less than 5 uv across 75 ohms
Linearity:	Output linear within 6% over a 40 db dynamic range for inputs from 0.25 microvolts to 30.0 millivolts

Controls	Mc tuning. Kc tuning, RF range, RF tuning, RF attenuator, RF/IF gain, Function switch, AF gain. BFO switch, BFO tune, IF bandwidth. Calibrate/fine tune, Tuning lock. Dimmer (pre-set), Meter switch. AF Line Level (Pre-set), VFO INT/EXT Switch.
Power Supplies: (Optional Plug-in Units)	a. MA.6302 - AC Power Unit. Line 100 - 125 and 200 - 250 volts. 48-420 cps, 10 V/A approximately. b. MA.6704 - Dry Battery Pack capable of supplying equipment requirements for a period of eight (8) hours. (Not plug-in.) c. MA.6301 - DC Converter for operation from 11 - 30 volts DC with either line at ground. d. MA.6300 - AC Power Unit/Battery Charger with trickle charging facilities for b.
Environmental Conditions:	Operating +55°C to 0°C Storage +70°C to - 40°C
Dimensions:	17" x 3-1/2" x 17" with 19" rack mount front panel.
Weight:	Approximately 25 pounds depending on power supply.
Rear Panel Connections:	a. Power cord, integral with plug-in AC power supply, 8 foot cord, three wire grounding plug. b. Antenna input, UG-1094/U mates with UG-88B/U. c. Line audio output, -16 vdc regulated, manual gain line, (barrier strip.)

Rear Panel Connections: (continued)

*d. 1 mc input/output for an external standard 1 mc or diversity operation; 2nd VFO input/output (3.6 - 4.6 mc); RF input/output (2-3 mc); 1.6 mc IF output; 455 kc IF output, (100 kc optional); AGC input/output ; miniature connector UG-1618/U mates with UG-1460/U.

*NOTE: Refer to Ch.2, para 5 for detailed explanation.

Accessories:

The following are available for use with the RA. 6217 series of receivers:

RA.6337 LF Adapter, 3 kc - 980 kc.
RA. 6336 Panoramic Display Unit
RA.6367 Twin Version of series RA.6366
MA.6355 Crystal Oscillator Unit
MA.350B Synthesizer, phase lock type
MA. 350C Synthesizer, filter mixer type for high speed frequency transitions
RA.6377 Comparator for off-the-air measurement of frequency
MA.168 Diversity Switch

CHAPTER 2

INSTALLATION

1. After unpacking the receiver, a careful examination should be made for any visible signs of damage. Mounting holes are provided in the front panel for mounting the unit either in a standard 19" relay rack or cabinet. Adequate ventilation should be provided to prevent the operating temperature from exceeding 55°C. All Power and RF Connections are on rear of receiver.

2. Power Supply (MA.6302 only)

Ensure that the voltage selector switch located on the rear panel is in the correct position; i.e. up for 234 volts or down for 117 volts and that the switch locking plate is secured. Determine that fuses F1301 (0.5 amps) and F1302 (1.0 amps) have the correct rating. Optional supply modules are described in Sect. I, Chap. 5, Para. 19, 20 and 21.

3. Antenna

RF input J201 located on the rear panel is designed to match a 75 ohm unbalanced transmission line.

4. Audio Outputs

(1) A 10 milliwatt headphone jack is located on the front panel.

(2) Two 600 ohm outputs, one at 10 mw and one at 1 mw are connected to the rear panel terminal strip TB101.

5. External Connections (Main Chassis)

The following input and output connections are located on the rear panel of the receiver:

(1)	J102 - 1 mc output) J103 - 1 mc input)	For an external standard 1 mc or diversity operation.

NOTE: When operating the receiver with an external 1 mc standard it is necessary to remove the internal 1 mc crystal.

(2)	J106 -2nd VFO input (3.6-4.6 mc) J107 -2nd VFO output (3.6-4.6 mc)	For diversity operation or, for external synthesizer inputs, or for use with the RA.6366 Panoramic Adapter.
(3)	J105 -RF input (2-3 mc) J104 -RF output (2-3 mc)	Input from an LF Converter. For use with RA. 6366 Panoramic Adapter.

(4) J113- 1.6 mc WIDE output — 75kc wideband output to Pan. Adapter. (RA6217C & RA6217E only)

(5) TB101 - 8 position terminal block — For external connections.

6. External Connections (IF Package)

(1) J3002 - 455 kc OUT
(or 100 kc - when this option chosen) — For ancilliary equipment

(2) J3003 - 1.145 mc IN/OUT
(or 1.5/1.7 IN/OUT 100 kc option) — Output for Diversity; Input for use with Synthesizer.

(3) J3004 - 1.6 mc OUT — To RA. 6366/RA.6367 Pan. Adapters when used.

(4) TB3001 - AGC Bus Terminal — For Diversity Operation

AM Detector LOAD
AM Detector OUT — Linked externally except for certain Diversity operations.

7. External Connections (RF Package)

(1) J201 - RF input — Antenna Connection.

8. IF Converters

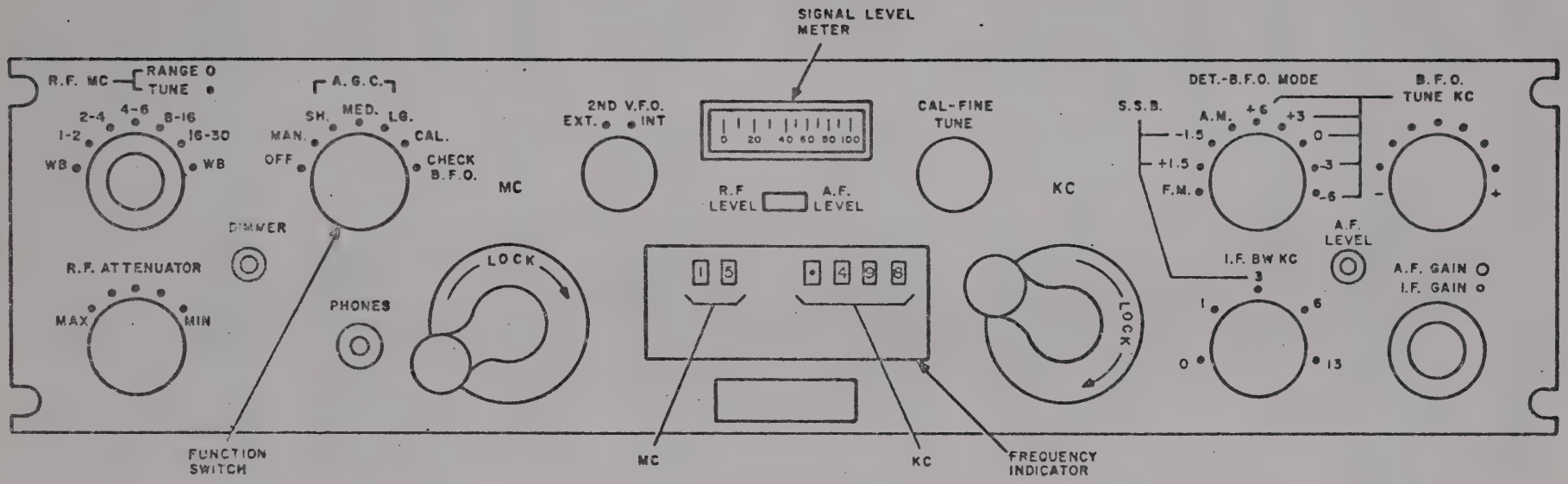
At the Customers option, the Receiver may contain either one of the two IF Converter modules listed below:

(1) RA. 6217A - 455 kc output, crystal frequency 1.145 mc.

(2) RA. 6217A-2 100 kc output, crystal frequency 1.500 mc.

As well as the 455 kc or 100 kc IF outputs, these converters provide facilities for master/slave operation in diversity systems or for the injection of an external synthesizer or frequency standard.

For master/slave operation, remove the crystal in the slave unit and connect the crystal output from the master receiver (1.500 or 1.145 mc) to the slave unit.



RA6217A CONTROLS AND INDICATORS.

CHAPTER 3

PART 1

BRIEF DESCRIPTION OF CONTROLS

The method of operation depends largely upon the purpose for which the receiver is being employed. The controls described here are used to optimize reception in the desired mode.

References to the controls are in capitals and are in accordance with the front panel titles adjacent to them.

1. FUNCTION SWITCH

a. This switch provides facilities for power OFF, MAN, CAL, and check B.F.O. along with three A.G.C. selections. The choice of time constants (Sh. -Med. -Lg.) depends largely on mode condtions. The long time constant should normally be used with keyed CW or SSB signals and in conjunction with the manual I.F. gain control as required.

b. Short, medium and long time constants may be used for FM. AM, MCW or FSK, depending on fading conditions. For these modes of operation the manual I.F. gain control should normally be kept at maximum.

2. CAL

In the calibrate position, 100 kc markers provide an audio beat at each 100 kc interval of the KC digital readout. The readout scale may be corrected at the nearest 100 kc point by using the CAL-FINE TUNE control (Internal VFO only).

Note: When calibrating the KC readout, the DET-BFO MODE switch should be in the A. M. position.

3. CHECK B.F.O.

In this position the B.F.O. frequency may be set to coincide with the I. F. center frequency by setting the B.F.O. mode switch to zero and adjusting the B.F.O. TUNE KC control.

Note: To avoid ambiguity the KC tuning control should be offset from any 100 kc interval of the KC digital readout so that no 100 kc calibration beat note is audible.

4. R.F. ATTENUATOR

This control enables the operator to reduce the level of all incoming signals when strong unwanted signals are present which cannot be sufficiently rejected by tuning the antenna.

5. R. F. MC - TUNE o

If maximum sensitivity is not required, the antenna need not be tuned unless strong unwanted signals are present. The presence of very strong signals anywhere within the spectrum may cause cross-modulation unless the antenna is tuned. Under these conditions, CARE MUST BE TAKEN TO AVOID TUNING THE INPUT TO THE INTERFERING SIGNALS instead of the desired signal.

6. R. F. MC - RANGE O

This switch provides for the selection of any one of five frequency ranges or a wideband position. Two wideband positions are provided for ease of operation.

7. 2nd V. F. O. EXT. - INT.

Selects either the internal 2nd V. F. O. or an external 3.6-4.6 mc source from a master receiver, frequency synthesizer etc.

8. R. F. - A. F. LEVEL

This control switches the meter to monitor either R. F. or A.F. signal levels.

9. CAL - FINE TUNE

This control enables the KC digital readout to be calibrated at discrete 100 kc points or to correct small tuning errors when the KC control is locked (Internal VFO only).

10. MC*

This control selects the desired MC frequency (0-29) as shown on the first two digits of the readout. Its setting should be checked periodically to ensure that it is reasonably central with respect to the band in use. This is indicated by a reduction in signal or noise on either side of the correct setting.

It can be locked in place by rotating the outer ring in a clockwise direction.

When the MC readout is set to zero, switches are actuated to permit use of the LF converter, (RA. 6337), extending the frequency range down to 3 kc.

* RA. 6217 B and D series receivers are fitted for external Mc control.

11. KC*

a. This control selects the last three digits of the readout (0-999). The KC setting can also be locked using the outer locking ring.

b. The remaining digit in the readout will indicate either a decimal point, a plus sign or a minus sign.

c. When the decimal point appears the frequency can be read directly, but when the minus sign appears the true frequency can be determined by subtracting one from the units digit on the MC readout. (First number to the left of the minus sign). Conversely when the plus sign appears, the true frequency can be determined by adding one to the MC units digit.

* RA.6217D external control only.

12. DET-B.F.O. MODE

a. This switch selects either FM, two SSB positions, AM or five coarse positions of the B.F.O.

b. In the FM position a frequency discriminator is used to demodulate the input signal. To demodulate USB signals use the -1.5 position and to demodulate LSB signals use the +1.5 position.

c. The AM position selects diode demodulation. Five variable B. F. O. positions (+6 to -6) are used in conjunction with the B. F. O. TUNE KC control providing a range of approximately ±8 kc.

d. The B.F.O. function is used to demodulate keyed CW, FSK, facsimile, etc.

13. B. F. O. TUNE KC

This control operates as a vernier for the five coarse positions on the B. F. O. mode switch, and has a range of approximately ±3 kc.

14. I. F. BW KC

This control selects any one of five bandwidths which are determined by crystal filtering. The bandwidth and its usual corresponding mode are listed below:

I. F. BW KC (Continued)

0.2 kc - CW
1.0 kc - CW or FSK
3.0 kc - AM or SSB
6.0 kc - AM
* 13.0 kc - FM or AM

* Note: In the RA. 6217C a 20.0 kc bandwidth replaces the 13.0 kc position. In special cases a 60 kc bandwidth replaces the 13.0 kc position.

15. A.F. LEVEL

This preset control sets the A. F. level in a separate stage for feeding a 600 ohm, 1 milliwatt line. It is unaffected by the position of the A. F. gain control.

Note: It is desirable that the A. F. level never be turned toward its maximum position (fully clockwise) unless the output transformer is suitably terminated.

16. I. F. GAIN

a. This control is operative both in the MAN. and A. G. C. position, when in the MAN. position the control setting should always be at a minimum consistent with a satisfactory A. F. level. With the system switch in any of the three A. G. C. positions, reducing the R.F./I.F. GAIN also reduces the A.G.C. gain which degrades the A. G. C. characteristics. Therefore in any of the A. G. C. positions it is desirable that the R.F./I.F. GAIN control be set to maximum.

b. A possible exception to this occurs when receiving interrupted signals in which the carrier is periodically switched off. In this case, receiver noise could be troublesome during the intervals.

17. A. F. GAIN

This control adjusts the gain to the headphones and the 10 milliwatt output on the rear panel.

18. DIMMER*

This control adjusts the digital readout light intensity.

* Not applicable to RA. 6217D.

CHAPTER 3

PART 2

OPERATION OF CONTROLS

OPERATING INSTRUCTIONS FOR RA. 6217

1. INITIAL SWITCH ON
2. GALIBRATION OF RECEIVER KHz COUNTER
3. CHECK BFO FACILITY
4. CHECK ON CALIBRATION OF MHz COUNTER
5. USE OF HIGH GAIN ANTENNA AND RF ATTENUATOR
6. SEARCHING FOR SIGNALS IN WIDEB AND
7. TUNING THE ANTENNA
8. DANGER OF TUNING ANTENNA TO WRONG SIGNAL
9. USE OF RF GAIN CONTROL AND A. G.C.
10. RECEPTION OF A. M. SIGNALS
11. RECEPTION OF C. W. SIGNALS
12. RECEPTION OF U.S.B. SIGNALS
13. RECEPTION OF L.S.B. SIGNALS
14. RECEPTION OF F. M. SIGNALS

OPERATION OF RA. 6217

Reference to Part 1 and description of the Controls should be made before continuing with Part 2 - Operation. Understanding the purpose of the Controls will enhance the Operation as described herein.

1. INITIAL SWITCH ON

Connect an antenna to the R.F. INPUT J201 at the rear of the receiver.

Turn the knobs to the following positions.

R. F. MC RANGE	WB
R. F. ATTENUATOR	MIN
FUNCTION SWITCH	A.G.C. MED
MC	05
2nd VFO	INT
METER	R. F. LEVEL
KC	500
DET-BFO MODE	-1.5
I.F. BW KC	3
AF GAIN	FULLY CLOCKWISE
RF GAIN	FULLY CLOCKWISE

Connect a headset to the PHONES jack' (adjust the AF GAIN to a desirable level), and slowly turn the KC dial clockwise. Signals should be heard as the dial is turned. These signals are in the 5 MHz band as denoted by the 05 at the left hand side of the window. The numbers at the right hand side denote in KHz the frequency of the signal in the 5 MHz band. For example if the numbers showing are 05.582 the receiver is tuned to 5.582 MHz.

NOTE: This initial switch on indicates that the receiver is operating. The frequency mentioned above as 5.582 MHz will only be accurately measured if the receiver KHz scale is calibrated. The receiver has a built in crystal calibrator to enable the operator to calibrate the KHz scale each 100 KHz. The MHz section of the frequency read out does not need to be calibrated as small movements of this dial do not affect the receiver frequency.

2. CALIBRATION OF RECEIVER KHz COUNTER

Switch the knobs as follows:

FUNCTION SWITCH	CAL
2nd VFO	INT
DET-BFO MODE	AM
IF BW KC	3
AF GAIN	AS DESIRED

IF GAIN	FULLY CLOCKWISE
KC	500
METER	RF LEVEL
CAL-FINE TUNE	MID RANGE OR ADJUST FOR OUTPUT

Under these conditions the front panel meter should have some deflection and an audio note should be heard from the headset. Turn the CAL-FINE TUNE knob until the pointer on the meter peaks.

A null will be heard as the CAL-FINE TUNE knob is turned to change the audio output from a high tone to a low tone. Continued tuning will result in no audio output, this quiet region is referred to as a zero beat note. Turning the knob still further in the same direction will result in a low tone changing to a high one.

The correct calibration point is at this zero beat point. Check that the scale is set to 500 and adjust the CAL-FINE TUNE knob for the zero beat.

Turn the KC dial to change the reading to 600. A zero beat should occur within 1 KHz of 600. This slight error may be corrected for at this point by setting the reading to 600 and adjusting the CAL-FINE TUNE for a zero beat.

Turn the KC dial to the other calibration points not yet covered, i.e. 700, 800, 900, 1000, 400, 300, 200, 100 and 0. At each of these points it should be possible to obtain a zero beat by adjusting the CAL-FINE TUNE knob with the correct reading in the window.

This clibration facility will enable the operator to measure the frequency of any signal he receives by calibrating the KHz dial at the nearest 100 KHz point to the signal frequency he wishes to measure. The accuracy of this measurement will be within 1 KHz.

3. CHECK BFO FACILITY

The BFO in the receiver can be set to exactly the center of the IF passband by using the CHECK BFO control.

Set the controls as follows:

FUNCTION SWITCH	CH BFO
2nd VFO	INT
DET-BFO MODE	0
IF BW KC	3
AF GAIN	AS DESIRED
IF GAIN	FULLY CLOCKWISE
KC	530
METER	RF LEVEL

Under these conditions a zero beat note should be heard when the BFO TUNE KC knob is near the center of its range. The KC dial should not be set near a 100 KHz point as a wrong beat note will be heard.

The BFO TUNE KC control will vary the frequency by 3 KHz on either side of the number set by the DET BFO MODE switch. In this case the frequency will shift from minus 3 KHz to plus 3 KHz. These frequency changes should be heard in the headset. When the DET BFO MODE switch is at the +6 position, the frequency will change from + 3 to + 9 KHz. When the BFO has been centered and a zero beat note obtained this may be used as a standard to measure the frequency of a signal.

With the BFO centered and the DET BFO MODE switch at 0 a zero beat will be heard when a signal is passed over. The frequency reading of the counter will be the frequency of the transmission if the KC dial is calibrated as detailed in para. 2.

When CW signals are being received, the BFO TUNE control should be adjusted to give an acceptable beat note.

4. CHECK ON CALIBRATION OF MHz COUNTER

Set the controls as follows:

RF MC RANGE	WB
RF ATTENUATOR	MIN
FUNCTION SWITCH	AGC MED
MC	01
2nd VFO	INT
METER	RF LEVEL
KC	500
DET-BFO MODE	-1.5
IF BW KC	3
AF GAIN	AS DESIRED
RF GAIN	FULLY CLOCKWISE

With a headset plugged into the PHONES jack noise or signals should be heard. Turn the dial towards 02. The noise output should noticeably reduce in passing from 01 to 02 and rise to a peak at 02. This rise of noise at each setting of the MC number indicates that the receiver is live to that band, when tuning this control the optimum setting is at the peak of the noise output.

Check that there is a rise of noise at each setting from 01 thru 29. Due to a drift eliminating loop the receiver may be used anywhere within the rise of noise area.

The receiver is now ready to receive signals.

5. USE OF HIGH GAIN ANTENNA AND RF ATTENUATOR

If a high gain antenna is used to feed the receiver and there is a high activity of signals being received then the noise input to the receiver may be excessive. This situation is easily observed by switching to one of the AGC positions. In this condition the RF level meter will read, showing that the noise is operating the AGC. When this happens the RF ATTENUATOR should be switched in by as many steps as are necessary to stop the noise making the RF level meter read. This will not effect the sensitivity of the receiver under these conditions.

The attenuator should also be used when strong signals are causing interference. This control reduces the level of all signals at the antenna.

6. SEARCHING FOR SIGNALS IN WIDEBAND

To search for signals the controls should be set as follows:

RF MC RANGE	WB
RF ATTENUATOR	AS DESIRED
2nd VFO	INT.
DET-BFO MODE	0
BFO TUNE KC	AS DESIRED
IF BW KC	3
AF GAIN	AS DESIRED
RF GAIN	FULLY CLOCKWISE
FUNCTION SWITCH	AGC MED

Set the MC number to thedesired MHz band by adjusting for the maximum rise of noise. Tune the KC control from 0 thru 1000 KHz. Signals should be heard across the band as the KHz tuning passes over each one. Each signal passed over will produce an audio output. The form of this audio output will depend on the type of signal being received and will dictate which position of the DET-BFO MODE switch to use and the optimum bandwidth to select once a desired signal has been found.

7. TUNING THE TNTENNA

When searching for signals in the wideband mode the entire spectrum from 1 thru 30 MHz is present at the front end of the receiver. A disadvantage of this is that transmitters near the receiving site feed large signals into the receiver which may tend to block out the smaller ones.

In order to prevent signals in bands other than the one being selected from causing interference, an antenna peaking circuit is included in the receiver. When this is correctly set up only the desired signal and those close to it are allowed into the receiver.

This antenna peaking circuit is divided into bands and is labeled RF MC RANGE. Each of these bands covers a range of frequencies as marked on the front panel. For example, 16-30 covers the frequency range from 16 MHz thru 30 MHz.

Any frequency between the limits of these bands is selected using the RF MC TUNE control.

The correct way to use the TUNE control is to select the desired signal in Wideband and then to switch to the appropriate band in which the desired signal lies. For example, if a wanted signal is found at 12.528 MHz the RF MC RANGE control would be switched to 8-16. The signal being listened to would probably then be inaudible, but peaking the RF MC TUNE control to about mid-range would bring the signal back again. The antenna would now be tuned to the wanted signal, as indicated by the desired signal level being at its peak.

8. DANGER OF TUNING ANTENNA TO WRONG SIGNAL

An exception to this method is where a large interfering signal is causing an unwanted output. There is a possibility that the antenna will be tuned to this unwanted signal. This will be prevented if the RF ATTENUATOR is switched to MAX after the desired signal has been found in Wideband and the antenna peaked on noise at the frequency displayed in the window. The RF ATTENUATOR should then be switched back to its original setting to receive the desired signal.

NOTE: The RF MC RANGE switch should be in the WB position when searching for signals. An operator may search for signals with the KC dials. The TUNE control, however, is quite sharply tuned and continuous tuning would be required.

9. USE OF RF GAIN CONTROL AND AGC

The AGC positions of the function switch refer to automatic gain control. When a large signal is being received there is a danger that overloading will occur, resulting in distortion. The solution to this problem is to reduce the gain of the receiver until overloading stops. In the MAN position of the function switch manual control of the receiver gain is effected using the RF GAIN control.

In this case the operator has to adjust the setting of the RF GAIN to reduce the receiver gain.

In the AGC positions, however, the gain of the receiver is automatically reduced, making it unnecessary for the operator to use the RF GAIN. The control is still operative under these conditions but should not normally be used. An exception to this is when receiver noise increases during the no-transmission period. Signals such as Morse and SSB will exhibit these characteristics. The use of the AGC will help to reduce the effects of fading, which result in the strength of a signal varying at the antenna. For large signals wide variations at the antenna will not be noticed at the output.

The SH, MED and LG refer to the short, medium and long time constants associated with the discharge times of the AGC circuitry. The type of signal being received will govern the time constant being used.

10. RECEPTION OF AM SIGNALS

An AM signal refers to one which is amplitude modulated. This type of signal normally carries voice or music and is widely used by local Radio Stations in the 535 KHz thru 1.6 MHz band. International Broadcasts will also be found between 6 MHz and 21.7 MHz.

When searching for signals, as described in para. 6, some will be found that have voice or music on them along with a beat note that sounds like a whistle.

Switch the DET-BFO switch to AM. The whistle should disappear leaving the broadcast coming through clearly. The RF level meter may be used to tune in the signal. If desired the antenna may be tuned as described in para. 7.

The minimum bandwidth setting of the IF BW KC control for AM signals is 3 KHz, but wider bandwidths will produce more clarity in the sound heard, providing adjacent signals do not produce interference. The FUNCTION SWITCH should be set to AGC to reduce the effects of fading. The time constant used is not generally important for AM.

11. RECEPTION OF CW SIGNALS

A CW signal refers to one which is a continuous wave signal. Morse code transmissions fall into this category where a continuous wave is switched on and off to produce a series of dots and dashes.

To receive this type of transmission the DET BFO switch should be switched to the 0 position to use the BFO. The BFO TUNE control should be adjusted to produce a desirable tone.

The BANDWIDTH KC knob should be used in the narrowest position for this type of signal, either 0.2 KHz or 1.0 KHz to reduce the effects of interference from adjacent signals.

For hand keyed CW the FUNCTION SWITCH should generally be used in the MAN position with the RF GAIN control adjusted for a reasonable audio output. The long AGC time constant may also be used if the breaks in transmission are short.

For high speed Telegraphy the FUNCTION SWITCH should be used in the AGC SH position to reduce the effects of fading and to make use of the short discharge time of the AGC.

The BFO is also used for the demodulation of FSK and Facsimile type signals using associated equipment. When a very stable BFO is required the +1.5 or -1.5 positions of the DET-BFO MODE switch should be used. The KC control should then be slightly offset to give the desired output.

12. RECEPTION OF UPPER SIDEBAND SIGNALS (U.S.B.)

This type of signal is essentially an AM signal (which transmits upper and lower sidebands) with the lower sideband rejected at the transmitter. These signals may have a full carrier, a pilot carrier, or a suppressed carrier transmitted with the sideband.

The DET-BFO MODE switch should be set to -1.5, IF BW KC to 3, and the KC dial tuned to obtain a maximum output at the desired frequency. The resultant output will probably sound garbled and unintelligible. While listening to this output adjust the CAL-FINE TUNE knob slowly until the signal sounds clear and intelligible. The U.S.B. signal is now tuned in. Any one of the three AGC positions may be used for this type of signal. The RF GAIN control may be used to reduce the receiver noise output when pauses in the transmission occur.

13. RECEPTION OF LOWER SIDEBAND SIGNALS (L.S.B.)

The procedure for this is identical to above except that the DET- BFO MODE switch is in the +1.5 position.

14. RECEPTION OF FM

The FM position of the DET-BFO MODE switch allows reception of Frequency Modulated signals. This is narrow band communications FM and should not be confused with Broadcast FM which is in the VHF bands.

The bandwidth of the FM output will be limited by the IF BW KC switch setting and should be set to the widest position consistent with the deviation on the FM signal being received.

The receiver should then be tuned as if an AM signal were being received.

CHAPTER 4

BRIEF TECHNICAL DESCRIPTION

1. INTRODUCTION
2. R. F. UNIT
3. 1st MIXER AND 40 MC FILTER
4. 2nd MIXER
5. 3rd MIXER
6. 1st V. F. O.
7. 2nd V. F. O.
8. 1 MC OSCILLATOR AND CALIBRATOR
9. 37.5 MC GENERATOR
10. 37.5 MC BANDPASS FILTER
11. 1.6 MC FINAL I. F. ASSEMBLY
    a. 1st 1.6 Mc IF Amplifier
    b. 2nd, 3rd, & 4th IF Amplifiers
    c. A. G. C. Board
    d. Demodulator Board
    e. FM Demodulator Boards
12. A. F. AMPLIFIER BOARD
13. I. F. OUTPUT CONVERTER
14. POWER SUPPLY MODULE

ILLUSTRATION - BLOCK DIAGRAM FIGURE 1

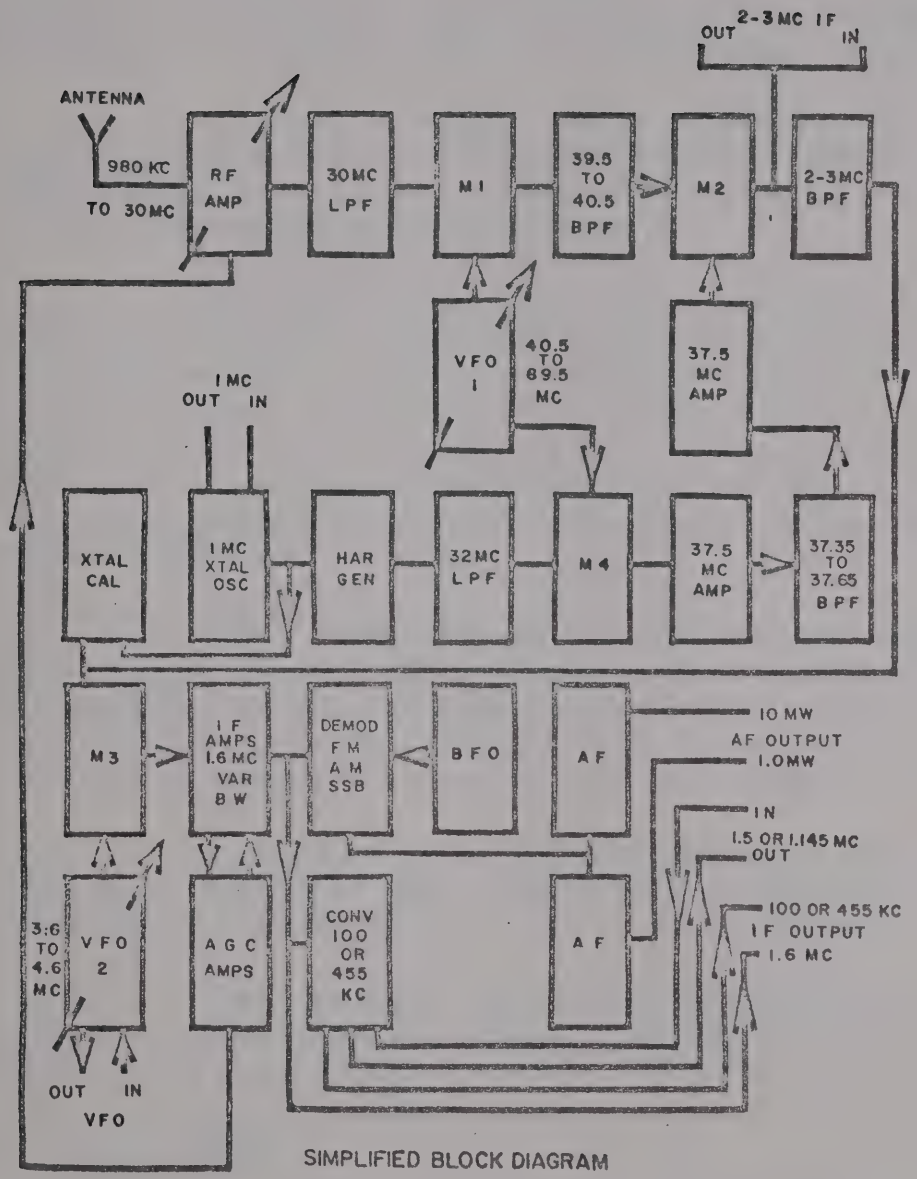


FIGURE 1

RA.6217

CHAPTER 4

BRIEF TECHNICAL DESCRIPTION

1. With the aid of the block diagram, this chapter briefly describes the basic theory of operation. For a more complete discussion of the receiver and its drift-cancelling frequency selection systems, refer to the detailed circuit description in Chapter 5.

Incoming RF signals are amplified and fed to the first mixer where they are mixed with one output from the first V. F. O. to produce an output spectrum centered on 40 mc approximately 1.0 mc wide at the output of the 40 mc B.P.F.

The output of the first V. F. O. is also fed to the 'Harmonic Mixer' M4, where it is mixed with harmonics (up to the 32nd) of the 1.0 mc crystal oscillator. The output circuit of the Harmonic Mixer restricts the useful settings of the 1st V. F. O. to intervals of 1.0 mc; that is when the 1st V. F. O. frequency minus a 1.0 mc harmonic produces a difference of 37.5 mc. This signal is amplified, filtered, and mixed with the 40 mc 1st IF spectrum in the 2nd mixer to produce a wideband 2nd IF output between 2 and 3 mc.

Thus, if the 1st V.F.O. drifts, an equal change occurs in both the 40 and 37.5 mc channels and the drift is cancelled in the 2nd Mixer. The stability of this frequency selection system is therefore that of the 1.0 mc crystal. The 1st V. F. O. is set by the Megacycles dial of the receiver and acts as an electronic bandswitch.

The 2-3 mc converted spectrum is fed to a conventional single superheterodyne interpolation receiver employing a final IF of 1.6 me and tuned by the 2nd V. F. O. (3.6 - 4.6 mc)

The complete receiver is tuned by varying the frequency of the 1st and 2nd V. F. O., no physical bandswitching is used. Double-tuned antenna coupling circuits are available for use as required.

2. R. F. UNIT

The incoming signal passes via a variable attenuator, low pass filter, and optional double-tuned filter to the first R.F. amplifier stage. The input circuits include a fuse, spark gap, and clamp diodes to provide overload protection. Two stages of R.F. amplification are used with coupling networks effective from 1-30 mc. Gain is controlled by variable emitter degeneration to ensure that the signal handling capability is not degraded, the control is delayed to give a adequate over-all signal-noise performance.

3. 1st MIXER AND 40 MC FILTER

Two transistors are used in the 1st Mixer which is balanced so that the 1st V.F.O. heterodyne signal tends to cancel at the signal input and I.F. output ports, thus reducing the possibility of oscillator leakage along the signal paths. This configuration also discriminates against spurious responses which may arise due to harmonic production with large signals at even order submultiples of the 40 mc 1st I.F. The 40 mc B.P.F. consists of eight cascaded tuned circuits and is approximately 1.3 mc wide at - 6 db, the extra bandwidth over the required 1.0 mc allows for drift of the 1st V.F.O. to occur without degradation of performance.

4. 2nd MIXER

This module includes a conventional single transistor mixer stage, a cascode 37.5 mc amplifier stage and a 2-3 mc bandpass filter. The filter is so arranged that a rejection notch occurs at 1.6 mc and gives maximum protection against interpolation receiver I.F. breakthrough, etc.

5. 3rd MIXER

This module includes a balanced diode ring mixer with large signal handling capability. The mixer is fed with a heterodyne signal from the 2nd V. F. O. via a 3.6 - 4.6 mc bandpass filter and suitable amplifiers. The mixer output is fed via a double-tuned 1.6 mc transformer to an amplifier stage and an external crystal filter which defines the widest final I.F. passband (The RA. 6217A crystal filter is 13kc; the RA.6217C filter is 20kc.)* A 100 kc signal derived from the 1.0 mc crystal oscillator is fed to the third mixer when required to check the interpolation receiver frequency calibration or B.F.O.

The RA. 6217C and E models provide an additional 1.6mc output band limited to 75kc which is used to feed the RA.6367 Panoramic Display Units in a "Wideband Receiver" system (RS.6504B).

* Special versions of the receiver include 60kc bandwidth filters.

6. 1st V. F. O. (Alternate MA. 6358)

This module provides suitable buffered outputs to the 1st and Harmonic (4th) mixers. The oscillator operates over the frequency range 41.5 - 69.5 mc and enables the required input spectrum to be selected together with an appropriate 37.5 mc signal from the Harmonic mixer. The variable element in the oscillator circuit is a straight line frequency capacitor which is mechanically coupled via suitable gearing to the Megacycles control and indicator.

The MA. 6358 replaces the variable oscillator in receivers suitable for remote control and contains 29 crystal oscillators selectable by DC contact closure.

7. 2nd V. F. O. (Omitted in D series receivers)

A carefully compensated oscillator operating in the frequency range 3.6 - 4.6 mc provides outputs via buffer stages to the 3rd mixer and to an output socket at the rear of the equipment so that Master and Slave operation with a companion receiver is possible. Facilities are also provided to enable the oscillator to be switched off and the module fed from an external synthesizer or other suitable source. The main variable element in the oscillator circuit is a straight line frequency capacitor which is mechanically coupled via anti-backlash gearing to the Kilocycles Control and Indicator. A Calibrate-fine tune control consisting of a small multi-turn potentiometer is provided to enable the Kilocycles indication to be corrected at discrete 100 kc points or to enable the receiver to be fine tuned when the main controls are locked.

8. 1 MC OSCILLATOR AND CALIBRATOR

This crystal oscillator and its harmonics govern the accuracy of the frequency conversion system. Facilities are provided for operation from an external standard source if required. Master and Slave operation with another receiver is also possible. The oscillator output is fed via suitable buffer stages to the Calibrator circuit, 37.5 mc generator module, and rear sockets. The Calibrator circuit contained in the module consists of a 10:1 digital divider which can be switched as required to provide a standard 100 kc signal (and Harmonics) to enable the 2nd V.F.O. frequency calibration and B.F.O. to be checked and corrected.

9. 37.5 MC GENERATOR

A transistor harmonic generator is used to produce a spectrum of harmonics from the 1.0 mc input signal. The Harmonic filter is lowpass and serves to attenuate harmonics above the 32nd which are not required in the frequency conversion process. This spectrum and an output from the 1st V.F.O. are fed at suitable impedances and levels to the Harmonic mixer stage M4 and produce a wanted output at 37.5 mc from the beat between the 1st V.F.O. and each 1 mc harmonic in turn as the V. F. O. is tuned through the range.

A tuned cascode 37.5 mc amplifier raises the required signal level and feeds the 37.5 mc filter module.

10. 37. 5 MC BANDPASS FILTER

This module houses a bandpass filter consisting of seven coupled tuned circuits. The -6 db bandwidth is approximately 300 kc to allow for a small amount of drift to occur in the 1st V.F.O. without significant effect on the receiver performance, and the skirts fall steeply to a high level of ultimate attenuation.

11. 1.6 MC FINAL IF ASSEMBLY

This assembly consists of various sub-modules and boards as follows:

a. 1st 1.6 mc IF AMPLIFIER

A sub-module containing the crystal filter assemblies, 1st 1.6 mc IF Amplifier and bandwidth selector switch.

b. 2nd, 3rd, & 4th IF AMPLIFIERS

A sub-module containing the 2nd - 3rd and 4th amplifiers. A.G.C. is applied to the 3rd amplifier and operates by emitter degeneration (as in the R.F. stages) but is so arranged that the control contribution made by this stage occurs before the R.F. stages start to control, thus providing for (S + N) to Noise Ratio to improve with increasing signal to an acceptable level. The amplifiers are tuned but heavily damped and relatively wideband compared with the crystal filter pass-bands.

c. A. G. C. Board

This board accommodates two tuned amplifier stages. The first provides outputs to the second, the IF output converter, and an output to a rear socket at 1.6 mc (75 ohms). The second is a relatively high level amplifier feeding the A.G.C. detector and averaging network. An emitter follower provides a low impedance output from the A. G. C. detector circuit and is coupled via diodes to the time-constant determining components and A.G.C. rear connection. A series circuit combining a DC Amplifier plus emitter follower provide a low impedance A.G.C. bus, a potentiometer is provided for setting the "no signal" control conditions.

d. Demodulator Board

This board accommodates an amplifier feeding the diode (envelope) detector in the A.M. channel, and a product detector together with alternative B. F.O. circuits in the C.W. and S.S.B. channel. The A.M. detector load is taken to a link on the rear panel of the equipment. Three separately selectable oscillators are available for the B.F.O. function providing IF+1.5 kc, IF -1.5 kc (Crystal controlled) and IF ±8 kc variable with coarse and fine controls. Emitter follower and amplifier circuits are used to isolate the B.F.O. in use from the product detector and to minimize pulling effects. Audio outputs are taken via the main chassis

cableform and the DET-B.F.O. switch to a separately mounted emitter follower which drives separate gain controls feeding the Line and Headphone A.F. amplifiers. The various demodulator functions are controlled from the DET-B.F.O. Mode switch assembly, while the B.F.O. Tune KC is the tuning control for the variable B.F.O.

e. FM Demodulator Boards

This circuit includes a crystal oscillator operating at 1.72 mc which is used in conjunction with the product detector to provide an input at 120 kc to limiter and pulse counting discriminator stages. The resultant A.F. output is fed via the DET-B.F.O. Mode switch to the A.F. gain controls and amplifiers.

12. A. F. AMPLIFIER BOARD

Two separate A.F. amplifiers provide outputs for Line and Headphone operation. The 10 mw Headphone amplifier uses a preamplifier and push-pull output stage, the 1.0 mw Line output employs a single stage amplifier. Negative feedback is applied to both stages. A.F. outputs are provided to rear terminals and a front panel headphone jack socket.

13. IF OUTPUT CONVERTER

This optional module houses a mixer together with suitable filter, amplifier, and crystal oscillator stages for the particular output frequency required. Standard modules provide outputs at 100 or 455 kc. Inputs and outputs are available for Master and Slave operation if required; alternatively, an external heterodyne signal can be employed. The A.C. operated unit uses a conventional series stabilizer circuit which takes account of supply voltage and load variations and is temperature compensated. Operation at a nominal 117 or 234 volts is possible, the appropriate condition being selected by a guarded switch.

CHAPTER 5

DETAILED CIRCUIT DESCRIPTION

1. RF UNIT

   a. Antenna Circuit
   b. RF Stages
   c. 30 Mc LP Filter

2. 1st MIXER AND 40 MC BP FILTER

   a. 1st Mixer
   b. 40 Mc BP Filter

3. 1st VFO

4. 1 MC CRYSTAL OSCILLATOR AND CALIBRATOR

   a. 1 Mc Crystal Oscillator
   b. Calibrator

5. 37.5 MC GENERATOR

   a. Harmonic Generator
   b. Low Pass Filter
   c. Harmonic Mixer (M4)
   d. 37.5 Mc Amplifier (1)
   e. 37.5 Mc BPF

6. SECOND MIXER

   a. 37.5 Mc Amplifier (2)
   b. 2nd Mixer
   c. 2-3 Mc BPF

7. SECOND VFO

8. THIRD MIXER

9. 1st 1.6 MC IF AMPLIFIER
   a. Crystal Filters

10. 2nd, 3rd, 4th IF AMPLIFIERS

11. AGC AMPLIFIERS

12. DEMODULATORS
    - 12.1 AM Detector
    - 12.2 Product Detector
    - 12.3 B.F.O.
    - 12.4 SSB Insertion Oscillators

13. EMITTER FOLLOWER AND METER ZERO

14. AUDIO AMPLIFIERS

15. FM INSERTION OSCILLATORS

16. FM DISCRIMINATOR

17. IF OUTPUT CONVERTER (455 KC or 100 KC)

18. AC POWER SUPPLY

19. DC TO DC CONVERTER (MA. 6301) (OPTIONAL)

20. AC POWER UNIT/BATTERY CHARGER (OPTIONAL)

21. NICAD BATTERY PACK - (MA6704) Dwg. G-02463 (OPTIONAL)

CHAPTER 5

DETAILED CIRCUIT DESCRIPTION

Reference should be made to the appropriate drawing for each section.

1. R. F. UNIT Dwg. No. G. 02022 (or G. 02396 - RA. 6217C)

a. Antenna Circuit

The input impedance at the antenna socket J201 is nominally 75 ohms unbalanced; incoming signals are fed via a 500 ma. fuse F201 and 30 mc low pass filter to the antenna attenuator and R.F. range switch. The fuse and associated spark-gap E201 serve as overload protection devices, the low pass filter attenuates signals above 30 mc/s coming from the antenna and also helps to prevent unwanted leakage to the antenna from the receiver. The antenna attenuator has five positions and provides a means of attenuating all incoming signals in nominal 10 db steps over the range 0-40 db.* The RF range switch S202, has seven positions; two wideband positions are provided for operator convenience, in these settings signals are fed via the wideband transformer T205 and coupling capacitor C215 to the base of the first RF amplifier transistor Q201. Resistor R210 provides the correct terminating impedance for the antenna and low pass filter under these conditions. The five remaining switch positions are used to select double-tuned input circuits as required, each circuit tunes over a frequency range slightly greater than one octave using the coil assemblies T201 through T206 and the ganged variable capacitor C211A and B. These circuits are aligned by means of adjustable ferrite cores in each coil and the trimming capacitors C207, C208, C209, C210 and C212. C228 is a trimmer common to all secondary windings and is used to determine the frequency range covered by C211. The tuned primary and secondary coil windings are tapped to provide the correct input and output impedances and also a satisfactory compromise between selectivity and overall noise figure.

* In RA. 6217C - 15 db steps for a 60 db range.

b. R. F. Stages

Two RF amplifier stages are employed and mounted together with associated circuits on the printed circuit board TB204. The selected input signal spectrum is applied to the base of the first RF amplifier transistor Q201 via the coupling capacitor C215. The diode CR202

protects Q201 against accidental overload. AGC and/or manual gain control is provided via the transistor. Q202 which acts as a variable emitter impedance with a value depending on the D.C. circuit conditions. The D.C. conditions corresponding to maximum gain are set by the potentiometer R215 with -4 volts applied to the AGC line. Under these conditions, Q202 has a low collector impedance and little degeneration occurs in the emitter of Q201. The action of the AGC circuits is to cause the AGC voltage to move toward zero thereby increasing the collector impedance of Q202 and decreasing the gain of Q201. The control characteristic is made more linear by the clamp circuit consisting of R217, CR201, R212 and the zener diode VR201.

C. 30 Mc Low Pass Filter

The output circuit of the first RF stage is a 30 mc low pass filter consisting of coil and capacitor assemblies A201 and A202 with terminating resistors R220 and R225. These serves to couple the amplified input spectrum via C223 to the base of Q203. The second RF stage Q203-Q204 operates similarly to the preceding stage and is coupled to the following first mixer stage by C225 and the 30 mc low pass filter assemblies A203 and A204. This type of interstage coupling is used in both cases to enable the RF amplifiers to operate over the frequency range 1-30 mc in the Wideband mode and to give protection against first IF breakthrough at 39.5 - 40.5 mc. It also provides protection against first mixer image frequencies in the range 80-110 mc and affords maximum rejection to the first VFO fundamental and harmonics, preventing leakage back to the antenna.

2. FIRST MIXER AND 40 MC BANDPASS FILTER Dwg. No. G-1304

a. First Mixer

Transistors Q301 and Q302 are arranged as a balanced mixer with the signal input and 40 mc IF output circuits balanced. The first VFO heterodyne signal is applied unbalanced to the emitters. Thus the VFO injection frequency tends to cancel at the signal input and output ports and even order input signal harmonics produced in the mixer tend to cancel at the output port. R311 functions as a mixer balance control. Signals from the RF amplifier module are applied to the primary of the unbalance to balance transformer T301. The secondary of T301 is loaded by R303 and R304 which provides an effective center tap for the balanced signal spectrum applied to the mixer. The collector load is balanced with respect to

ground by C309, C310 and forms the first section of the 40 mc bandpass filter (first IF). D.C. is applied to the mixer collectors via R312 and the center tap on L301. The first VFO heterodyne signal in the range 41.5 - 69.5 mc is applied in phase to the respective emitters via C304-C305 at such a level that mixing takes place. The required output spectrum in the range 39.5-40.5 mc is selected by the following bandpass filter.

b. 40 Mc Bandpass Filter

This filter consists of eight overcoupled tuned circuits in cascade, L301 thru L308 and C309 thru C138. The passband is made slightly wider than the necessary 1 mc to allow for possible drift in the first VFO and consequent shift of the required first IF spectrum. The skirt characteristics fall sharply to a very high level of ultimate attenuation. The filter input is balanced to match the first mixer requirements and an output is provided from a low impedance tap at the junction of C317 and C318 to feed the second mixer.

3. FIRST VARIABLE FREQUENCY OSCILLATOR Dwg. G-01308

This circuit is a Hartley type oscillator consisting of a variable inductance L1, capacitors C1, C2 and trimmer C3 which oscillates over the frequency range 41.5-69.5 mc. Tuning is accomplished by varying C1, a straight line frequency capacitor, which is mechanically coupled to the megacycles control, and alignment with the digital readout is accomplished by adjusting the core of L1 and trimming capacitor C3. The oscillations are sustained by Q1 and fed to two separate amplifier stages Q2-Q3 and Q4-Q5. Stage Q2-Q3 provides a buffered output which is fed to the first mixer while stage Q4-Q5 feeds the harmonic mixer M4.

4. 1 MC CRYSTAL OSCILLATOR AND CALIBRATOR Dwg. G-03412

a. 1 MC CRYSTAL OSCILLATOR

The 1 mc signal determined by crystal Y601 and its associated capacitors may be set precisely on frequency by adjusting trimming capacitor C620. This signal is amplified by transistor Q604 and fed via low impedance coupling to two separate 1 mc amplifiers, Q603 and Q602. The 1 mc signal amplified by Q603 is then fed via coil assembly A601 to the harmonic generator while the other amplifier Q602 provides two outputs; one to the calibrator and the other to a 1 mc rear panel output.

The coil of A601 is adjusted for a minimum signal at 1 mc allowing the useful harmonics appearing across R615 to be fed to the harmonic generator. Transistor Q601 provides suitable buffering for a 1 mc signal from an external frequency standard.

B. Calibrator:

This circuit consists of a 10 to 1 digital divider which provides a 100 kc signal to the third mixer. The 1 mc reference input signal is fed via R624 to pin 5 of the integrated circuit digital divider ML1. R625 and R626 provide a suitable DC bias potential at pin 5. R627, R628 and C622 provide a filtered DC operating potential between pins 4 and 7. The 100 kc square wave output from pin 1 is fed via R629, C625 and the diode switch CR601 to the third mixer module. C624 functions as a simple low-pass filter. The calibrator circuit is brought into operation by the application of -16 VDC via the system switch to E616. R630, R631 provide a DC potential to the diode switch CR601.

5. . 37.5 MC GENERATOR Dwg. G-01303

a. Harmonic Generator

The 1 mc signal and its harmonics from the crystal oscillator are fed to transistor Q701 via diode CR701 and trimmer capacitor C728 which is used to equalize the relative amplitudes of the harmonic spectrum. The harmonics are then further amplified here and passed to the 32 mc low pass filter.

b. 32 Mc Low Pass Filter (Harmonic L.P.F.)

The megacycle harmonics are fed through the four section Darlington type filter network to prevent unwanted harmonics from passing to the harmonic mixer M4. The resistor R704 and the potential divider R705 - R706 provide the correct termination impedances for the filter.

c. Harmonic Mixer, M4

Transistors Q702 and Q705 are arranged as a balanced mixer so that the harmonic spectrum and the input from the first VFO tend to cancel in the output circuit. Balance adjustment is provided by R709. The harmonic signal is applied to the base of Q702 via the potential divider R705, R706 and C717; also to the emitter of Q705 via C720.

The first VFO signal is fed to the base of Q705 via C719 and also to the emitter of Q702 via C718. The required 37.5 mc output is then fed via the filter assembly A701 to the first 37.5 mc amplifier.

d. 37.5 Mc Amplifier (1)

This tuned cascode amplifier consisting of Q703, Q704 and filter assembly A702 amplifies the wanted 37.5 mc signal while attenuating any unwanted products from the preceding mixer. The amplified signal is then fed via a low impedance link to the following 37.5 mc bandpass filter assembly.

e. 37.5 Mc Bandpass Filter Dwg. G-01305

The bandpass filter consists of seven under-coupled tuned circuits in cascade, providing a high degree of attenuation to signals outside the nominal 300 kc passband. A low impedance output feeding the second mixer module is provided from a capacitive divider C807. C808 on the last tuned circuit.

6. SECOND MIXER

a. 37.5 Mc Amplifier (2) Dwg. G-01301

The filtered 37.5 mc signal is further amplified by the tuned cascode amplifier consisting of transistors Q501 and Q502. The tuned transformer assembly A501 serves to couple the amplified signal at low impedance to the emitter of the second mixer Q503.

b. 2nd Mixer

Transistor Q503 combines the 37.5 mc signal with the 39.5 - 40.5 mc 1st IF spectrum from the 1st mixer module to produce a wideband 2nd IF output between 2 and 3 mc. This wideband spectrum is then fed to the 2-3 mc bandpass filter.

To clarify this frequency selecting system examples of dial settings and intermediate frequencies corresponding to various input signals are given below:

Dial Settings Mc	Kc	Signal Freq. f_s Mc	VFO-1 f_o Mc	Crystal Harmonic nf_c Mc	1st IF $f_o - f_s$	Het Freq. $f_o - nf_c$	2nd IF $nf_c - f_s$
4	1000	5.0	44.5	7th	39.5	37.5	2.0
5	0	5	45.5	8th	40.5	37.5	3.0
18	600	18.6	58.5	21st	39.9	37.5	2.4
18	700	18.7	58.5	21st	39.8	37.5	2.3
	800	18.8	58.5	21st	39.7	37.5	2.2

2-3 Mc Bandpass Filter

This filter limits the output spectrum from the second mixer to the required frequency band of 2-3 mc and sharply attenuates frequencies outside this range. One of the rejection notches is arranged to occur at 1.6 mc to reduce the possibility of breakthrough at the 3rd intermediate frequency. The filter input termination is formed by the resistor chain R511, R104 and the 75 ohm captive termination. (R104 and the captive termination are mounted at the rear of the main chassis and provide suitable feed points to the RA6366 Panoramic Adapter and from the RA6337 Low Frequency Adapter.) A low impedance feed to the third mixer module is provided from the transformer assembly A508. Circuits in the third mixer module are arranged to correctly terminate the filter.

7. 2nd VFO-Dwg. G-01309 (not included in D series receivers)

The second variable frequency oscillator is of the Hartley type and operates over the frequency range of 3.6 - 4.6 mc. The oscillator consists of transistor Q1, the inductive elements L1 in series with the signal winding of T1, two fixed capacitors C5 and C6, a trimming capacitor C4 and variable capacitor C3. The main tuning element C3 is a straight line frequency capacitor mechanically coupled to the KILOCYCLES control and digital indicator. The calibrate-fine tune control consists of a 500 ohm potentiometer (R103) in series with the control winding of T1. Adjusting this potentiometer changes the effective d.c. in the control winding and thus changes the inductance and frequency of the oscillator by virtue of the change in permeability of the ferrite core of T1. The d.c. supply to R103 and T1 is stabilized by the zener diode VR5.

The oscillator circuit is carefully temperature compensated and the zener diode combination VR1 through VR4 guards against frequency change due to supply voltage variations.

The oscillator output is taken from a low impedance tap on L1 via a resistive potential divider R7-R8 and coupling capacitor C7 to a diode switching arrangement CR1 -CR2. With the oscillator in

operation -16 volts d.c. is applied via the VFO INTERNAL/ EXTERNAL switch on the front panel to terminal 5 on the connector, thus supplying d.c. to the oscillator, forward biasing CR1, and reverse biasing CR2, to enable the oscillator to drive the first buffer amplifier Q2. When the VFO signal is supplied from an external source the -16 volts d.c. is removed from terminal 5 and applied to terminal 4 thus disabling Q1, forward biasing CR2, reverse biasing CR1 and connecting the input terminal A1 to the first buffer amplifier Q2.

The output buffer amplifiers Q3-Q4 are fed from the taps on the collector load of Q2.

Q3 provides a suitable output at 1000 ohms impedance via terminal A2 to feed the third mixer; Q4 provides an output at 75 ohms impedance via terminal A3 to the rear panel suitable for driving a companion slave receiver or for other external use as required.

8. 3rd Mixer - Dwg. G-01302 (or G-02291 - RA.6217C)

The 2-3 mc spectrum from the output of the second mixer module is fed via the input connector A3, the low-pass filter L8, C16, C17, and coupling capacitors C14, C15 to pin 3 of the balanced diode mixer assembly. The function of the L.P.F. is to discriminate against possible leakage of 37.5 mc and its harmonics from the second mixer. R17 terminates both the L.P.F. and 2-3 mc bandpass filter in the second mixer module. When the receiver function switch is in the Calibrate or Check BFO positions, a 100 kc signal from the calibrator circuit is introduced via the input connector A4 and diode switch CR1, to the junction of C14 - C15.

The 3.6 - 4.6 mc heterodyne signal from the second VFO is fed via the input connector A1 and a bandpass filter consisting of the inductors L1 through L4, and the capacitors C5, C7, C10, C11, to the primary winding of the unbalance to balance transformer T1. L4 is tapped to provide a low impedance output from the filter and R7 determines the filter load. The center tapped secondary winding of T1 provides a balanced signal drive to the push-pull amplifier stage Q2, Q3 which in turn provides the switching signal to pins 1 and 2 of the mixer assembly.

The mixer output is taken from pin 5 of the mixer assembly via C12 to a 1.6 mc double tuned transormer consisting of the inductors L5, L6 and the capacitors C6, C8 and C9. The inductors are both tapped to suit the respective source and load impedances.

Q1 operates as an amplifier with emitter degeneration provided by R4. The 1.6 mc amplified signal appearing across the collector load R2 is coupled via C2 to the output terminal A2 and feeds a 1.6 mc crystal filter which is external to the module and used to determine the widest IF passband.

In the calibrate position the 100 kc signal from the calibrator is fed via diode CR1 and capacitor C14 to pin 3 of the balanced mixer A1. The strong 100 kc signal causes useful calibration harmonics to be produced in the mixer. These harmonics (20th - 30th) provide markers at 100 kc intervals across the 2-3 mc spectrum and when mixed with the 2nd VFO signal produce a 1.6 mc signal which is passed to the IF amplifiers. The 16th harmonic of the 100 kc calibration signal is simultaneously fed to the IF amplifiers and AM detector to provide a reference signal which then beats with the 1.6 mc signal produced by the mixing process and results in an audio output reducing in frequency to zero beat as the VFO is tuned to the precise 100 kc points.

In the RA. 6217C and E receivers an auxiliary IF output centered at 1.6 mc with a 75 kc bandwidth is provided. The signal source is taken from the double tuned transformer L5-L6 via E1 to the base of amplifier Q4. The passband of L5-L6 has been widened by changing the value of C8 to increase the coupling between L5-L6. Amplifiers Q4 and Q5 are connected in cascode to ensure stability. From Q5 the signal is fed via emitter follower Q6 and the filter L10, C27-28-29 to the auxiliary 1.6 mc output on the rear panel providing 1 mv output to 50 ohms.

9. 1st 1.6 MC IF AMP Dwg. G-01505

The IF signal from the 3rd mixer is fed through the wideband crystal filter to the amplifier stage Q1601 via coupling capacitor C1602. R1601 provides the correct termination for the filter. After amplification the signal passes through tuned coil assembly A1601 which, via dual tapped arrangement, provides two 1.6 mc outputs. One output is fed directly to the second IF amplifier via the bandwidth selector. The second output is fed at the correct impedance to separate sections of the bandwidth switch providing selection of the desired crystal filter.

a. Crystal Filters

Five crystal filters are normally provided as follows:

a) 13 kc * -Used to determine the widest IF passband and in circuit at all times. *(20 kc or 60 kc in some receiver versions.)

b) 6 kc
c) 3 kc
d) 1 kc
e) 0.2 kc

The appropriate filters are selected by the IF bandwidth selector switch on the front panel of the receiver.

10. 2nd, 3rd, 4th IF AMPLIFIERS Dwg. G-01501

The second IF amplifier stage consists of Q1, tuned coil assembly A1 and associated circuitry. The 1.6 mc signal is fed to Q1 via coupling capacitor C3. After amplification it is fed at low impedance via signal Tap 2 on the coil assembly and capacitor C6 to the base of the 3rd amplifier Q3. AGC is applied to this stage via Q2 which provides variable emitter degeneration in a similar manner to that described for the RF stages. Initially the clamp diode CR1 is biased off and the full AGC potential is applied to the base of Q2, as the AGC voltage falls (with increasing signal level) the impedance of Q2 increases and the gain of Q3 is reduced. Most of the gain control contribution made by this stage is arranged to occur before the RF stages start to control thus providing for the receiver overall signal plus to noise ratio to improve with increasing signal to an acceptable level. When the AGC voltage has fallen to approximately 2.5 volts, CR1 starts to conduct and in conjunction with R2 limits the effect of further AGC potential changes on the stage gain.

The tuned coil assembly A2 provides two tapped outputs; one of which is fed to buffer amplifier Q4 via capacitor C10 and the other 1.6 mc output to the 1st AGC amplifier. The 4th IF amplifier Q4 provides a buffered 1.6 mc signal which is then fed via the tuned coil assembly A3 at a suitable input level to both the AM detector and product detector. The gain of Q4 is pre-set by adjustment of R19.

11. AGC AMPLIFIER

The first AGC amplifier Q1401 is fed from the 3rd IF amplifier via coupling capacitor C1402. AGC threshold adjustment is provided by potentiometer R1403. The 1.6 mc signal is fed via tuned coil assembly A1401 and capacitor divider network to the 2nd AGC amplifier. It is also fed to a rear panel connector which must remain terminated (75 ohm captive termination) unless otherwise employed. A third output is provided for the IF output converter. (See paragraph 17) The second AGC amplifier comprised of Q1402 and tuned coil assembly A1402 increases the 1.6. mc signal level to feed the AGC diode detector CR10401 and emitter follower Q1403. Resistors R1411, R1412 and capacitors C1411 and C1412 provide an R. F. filtering and averaging network. Emitter follower Q1403 provides a low impedance d.c. source to feed the time constant determining networks in the a.g.c. line. Under "no r. f. signal" conditions, current flows through Q1403 producing a potential drop across R1413 such that diodes CR1402 and CR1403 are reversed biased relative to the potential on the a.g.c. time constant network established by the adjustment of R1415.

The function of the a.g.c. detector is to produce a negative going voltage at the base of Q1403 such that the potential drop across R1413 is reduced. When the potential drop across R1413 is more negative than that established on the time constant network, the diodes CR1402-CR1403 will conduct and tend to reduce the current flowing in the d.c. amplifier Q1404. Then, the potential drop across the d.c. amplifier collector load resistor R1420 will fall towards ground. This potential change is fed to the emitter follower stage Q1405 and then via the RF/IF gain control and further emitter follower stage Q1406 to the a.g.c. buss. The function of diodes CR1403, CR1402 is to act as a voltage operated switch to enable the time constant capacitors to charge quickly and to discharge slowly through the resistive network R1414, R1415, and R1416. The choice of time constant is selected by the function switch. The junction of these diodes (CR1402 - CR1403) is taken to a rear panel connector to permit diversity operation of two receivers with a common a.g.c. action. Thermistor RT1401 provides temperature compensation for d.c. amplifier Q1404.

12. DEMODULATOR BOARD - Dwgs. G-01504, G-01310, G-01758

a. AM Detector

1.6 mc signals from the 4th IF amplifier are fed via coupling capacitor C1202 to amplifier Q1201 and then to the diode detector assembly A1201.

The detected AM signal is taken via an RF choke, L1201 and a rear panel link (TB-1, 2-3) to the DET-BFO mode switch through detector load resistors R17 and R16. It is then fed to the emitter follower audio input terminal E1903. Here audio gain and line level potentiometers are provided to adjust the signal level before it is fed to the audio amplifiers.

Note: Two receivers may be connected for diversity operation by feeding the detected AM signals obtained in this stage to a common detector load and following stages in one of the two receivers.

b. Product Detector

The 1.6 mc signal from the 4th IF amplifier is also fed to the base of the product detector Q1202 via coupling capacitor C1204; while the BFO signals are applied to the emitter via the emitter follower stage Q1203 and buffer amplifier Q1204 and then mixed in the product detector with the incoming 1.6 mc signal to provide an output at audio to the AF stages or at 120 kc to the FM limiter and pulse counting discriminator stages.

C. Beat Frequency Oscillator

Three separate oscillators are available for CW and SSB operation. The BFO circuit consisting of Q1205, capacitors C1220, C1221, C1222, coil assembly A1202 and trimming capacitor C1219 uses varicap C1223 as a vernier (BFO tune kc) for the five coarse positions on the BFO mode switch. The oscillator frequency is adjusted ±2 kc by controlling the d.c. voltage at the varicap using potentiometer R5. The coarse positions (+6 to -6) are selected by inserting suitable potential dividers in the d.c. control circuit using the BFO mode switch. Thus control of the variable oscillator is provided over the range of 1.6 mc ±8 kc.

D. SSB Insertion Oscillators

The crystal controlled insertion oscillator consisting of Y1201, Q1206 and associated circuitry provides a frequency of 1.5985 mc which when used with the incoming 1.6 mc IF signal provides a -1.5 kc reinserted carrier to demodulate USB signals. Trimmer capacitor C1228 is used to "pull" the oscillator on frequency. In a similar manner, the crystal oscillator consisting of Y1202, Q1207 and associated circuitry provides a frequency of 1.6015 mc which when used with the 1.6 mc IF provides a +1.5 kc reinserted carrier to demodulate LSB signals. ON/OFF control is provided by the DET-BFO mode control which switches the -16 volts d.c. to either oscillator.

Note: The 3 kc receiver bandwidth would normally be used for SSB.

The diode CR1201 serves as an electronic switch to isolate the crystal oscillators from the variable BFO.

13. METER ZERO AND EMITTER FOLLOWER Dwg. G-01758 - see also Dwgs. G-01310 and G-01499

In the RF position the "S" meter is connected between the AGC line and a point of pre-set potential determined by R1905 which is used to set the meter zero under no signal conditions. The meter is calibrated to indicate signal strength in dbs relative to 1 microvolt input.

Note: Only with the IF gain control set at maximum is the correct calibration on the "S" meter maintained.

In the AF level position, the meter is connected across the 1 mw AF output via switch S104 and diode bridge CR101. See schematic G-01310. The red line indicates an AF output of 1 mw into 600 ohms.

The emitter-follower stage Q1901 is fed from either the diode, FM or product detector depending on the setting of the DET-BFO mode switch.

The stage presents a high impedance load to the appropriate detector and provides a low impedance output to feed the audio gain control R19B and line level pre-set potentiometer R20. See Dwg. G-01310.

14. AUDIO AMPLIFIERS Dwg. No. G-01499

a. Line Output Stage

An AF input taken from the wiper of the pre-set AF level control potentiometer is fed via R1517 and C1511 to the base of Q1503. A link is provided to enable C1510 to be included in parallel with C1511 to preserve the response to the lower audio frequencies if required. Negative feedback is provided from the collector to the base of Q1503 by R1513. T1502 serves to couple the amplified (1 mw) AF signals to the line output terminals.

b. Audio Output Stages

An AF input taken from the wiper of the manual AF gain control potentiometer is fed via R1500 and C1501 to the base of Q1500. A link is provided to enable C1502 to be included in parallel with C1501 to preserve the response to the lower audio frequencies if required. Negative feedback is provided from the collector to the base of Q1500 by R1503. T1500 provides a balanced AF drive to the following push-pull output stage Q1501 Q1502. R1508 and R1511 provide negative feedback over the respective amplifier transistors. T1501 provides a balanced load for the amplifier and an impedance match to the AF output (10 mw 600 ohm) terminals and phone jack.

15. FM INSERTION OSCILLATOR Dwg. G-02030 - see also G-01504

Q1 functions as an oscillator with the frequency closely controlled by the crystal Y1 at 1720 kc. The 16 volt negative supply line is switched on by the DET/BFO mode switch in the F.M. position. This causes the diode CR1 to conduct, the oscillator to function, and applies a d.c. voltage via R1 to the output (E1) together with the 1720 kc signal via C1.

The d.c. voltage causes the diode switch CR1201 on the detector board to conduct and applies the signal to the product detector Q1202 via the buffer stages Q1203, Q1204. The capacitor C1231 which is effectively between E1 and ground is an essential part of the oscillator circuit.

The product detector output centered on 120 kc (1720 minus 1600 kc) is fed to the input terminal E3 of the F.M. discriminator board.

16. FM DISCRIMINATOR - Dwg. G-02027

The frequency modulated R.F. output centered on 120 kc is fed via a 1.6 mc trap circuit (L1, C17, C1) to the base of a buffer amplifier Q1. The output from Q1 drives the amplifier Q2 so that amplitude limiting occurs. C6 bypasses residual 1.6 mc leakage to ground. Positive pulses appearing at the collector of Q2 are fed via C9 and CR1 to trigger the monostable multivibrator Q3, Q4. The time constant governing the output pulse duration is set by C10, R12, R13. R13 is adjustable and is set for optimum discriminator linearity. The output pulses are taken from the collector of Q4 via C12 and CR2 and tend to charge C13 to an extent proportional to the number of pulses. Since the number of pulses varies in sympathy with the frequency modulation, an AF component appears across C13 and is fed via the filter network R18, R19, R20, C14, C15, C16 to the output terminal E5.

17. IF OUTPUT CONVERTER - Dwg. G-01592 or D-03291

The 1.6 mc IF input signal derived from the AGC amplifier board is fed to the base of the mixer Q1803. The capacitor C1808 forms part of a signal potential divider and determines the correct input signal level. * The crystal oscillator Q1801, Y1801 operates at 1.145 mc and can be adjusted to the precise frequency by C1806. A low impedance output to drive the following buffer amplifier Q1802 is provided from the capacitive divider C1804 - C1805. If required, an output can be obtained from this point via C1802 and the input-output connector J3003 to drive a companion receiver. Conversely an external signal can be fed to J3003 in which case the crystal oscillator should be stopped by the removal of Y1801.

The buffer amplifier Q1802 functions to provide isolation between J3003 and mixer Q1803, and to provide a suitable heterodyne signal level to the emitter of Q1803 via C1810. The wanted output from the mixer at 455 kc* (1.6-1.145 mc) is selected by the double-tuned filter A1801, A1802, C1814, C1815, C1816 in the collector of Q1803. The filter coils are tapped to provide the correct input and output impedance levels. C1815 is used to couple the tuned circuits which are damped to ensure an adequate passband response.

The output amplifier stages Q1804, Q1805 are fed via C1818 and R1819. Negative feedback is provided via R1820 to ensure good linearity. The output tuned circuit A1803, C1819 is tapped to suit the collector and output impedance requirements.

* Note: An alternate version of the IF output converter provides an IF output at 100 kc. Y1801 then operates at 1.5 Mc.

18. POWER SUPPLY Dwg. G-01311

The fused (F1) a.c. power supply is filtered by capacitors C1 and C2 and taken to the voltage selector switch S1. The switch connects the split primary windings of T1 in series for 234 volts or in parallel for 117 volt operation. The secondary winding is also fused (F2), and feeds two bridge connected full wave rectifiers CR1 (regulated) and CR5 (unregulated).

The bridge rectifier CR1 feeds resistor-capacitor filter R2, C3, C4 and then a preregulator comprised of Q1, CR2, CR3, CR4, R3 and R4. The preregulator provides a constant current to the collector of the d.c. comparison amplifier Q3 and the base of control amplifier Q2. The comparison element Q3 takes a sample of the output voltage derived from VR1 and produces a signal proportional to the difference.

This signal is amplified by Q2 and applied to the series regulator Q4 to control the output voltage. Potentiometer R7 is used to adjust the output voltage to 16 volts. In the event of regulator failure the receiver is protected by the zener diode VR2 (18 volts) from serious voltage overload.

The second bridge rectifier CR5 provides 16 volts unregulated for ancilliary equipment.

19. DC TO DC CONVERTER Dwg. G-02449 (OPTIONAL)

The fused (F1) DC power supply is filtered by capacitors C1 and C2 and CR6 serves to protect the unit in the event of reverse polarity at the input terminals (J1-J2).

Q6 and Q7 in conjunction with T1 form a DC chopper circuit and CR7 and CR8 serve to protect Q6 and Q7 against over-drive in the reverse direction. Switch S1 is used to change the primary taps on T1 for either 12 or 24 volt operation.

The secondary winding of T1 is also fused (F2) and feeds two bridge connected full wave rectifiers CR1 (regulated) and CR5 (unregulated).

The bridge rectifier CR1 feeds capacitor filter C4 and then a pre-regulator comprised of CR2, CR3, Q1, R3, CR4, and R4. The pre-regulator provides a constant current to the collector of the DC comparison amplifier Q3 and the base of the control amplifier Q2. The comparison element Q3 takes a sample of the output voltage derived from VR1 and produces a signal proportional to the difference.

This signal is amplified by Q2 and applied to the series regulator Q4-Q5 to control the output voltage.

Potentiometer R7 is used to adjust the output voltage to 16 volts. In the event of regulator failure the receiver is protected from damaging voltages by the zener diode VR2.

The second bridge rectifier CR5 provides an unregulated DC voltage for ancilliary equipment.

20. AC POWER UNIT/BATTERY CHARGER Dwg. G-02535 (OPTIONAL)

The fused (F1) AC supply line is fed via the front panel ON/OFF switch to filter capacitors C1 and C2 and then to voltage selector switch S1. This switch connects the split primary windings of T1 in series for 234 volt or in parallel for 117 volt operation. The secondary winding feeds two bridge connected full wave rectifiers; CR1 (regulated) fused by F2, and CR5 (unregulated) fused by F3. Rectifier CR1 feeds a preregulator comprised of Q1, CR2, CR3, CR4, R3 and R4. The pre-regulator provides a constant current to the collector of the d.c. comparison amplifier Q3 and the base of control amplifier Q3 and the base of control amplifier Q2. The comparison element Q3 takes a sample of the output voltage derived from VR1 and produces a signal proportional to the difference. This signal is then amplified by Q2 and applied to the series regulator Q4 to control the output voltage. Potentiometer R7 is used to adjust the output voltage to 16 voltage. Potentiometer R7 is used to adjust the output voltage to 16 volts. In the event of regulator failure the receiver is protected from serious voltage overload by the zener diode VR2 (18 volts).

Bridge rectifier CR5 provides unregulated d.c. for operating the battery charger and ancillary equipment.

The constant current type charging circuit comprised of Q5, R11, R12, R13, and C8 provides a safe charging current for the battery pack. The current is limited so that the batteries may be charged continuously without any resulting damage. Diode CR6 provides protection against reverse polarity of the battery.

Switch S2 is used to switch from the charge position-when operating on A.C. - to the battery "ON" position.

21. NICAD BATTERY PACK - MA6704- Dwg. G-02463 (OPTIONAL)

The MA6704 Battery Pack is comprised of a number of 'D' size nicad cells which are mounted into clips contained in a metal housing. The MA6704 provides 16 V to the RA6217 (and the RA6337, RA6366 units when all three are used in System RS6504 configuration). A potentiometer is provided also for manual adjustment of output voltage and is located on the System front panel.

The MA 6302 AC/Battery Charger Unit is available for use with the MA 6704 for recharging purposes. Estimated System operation under power from the MA 6704 is 8 hours.

The MA 6704 is approximately the size of and mounts to the top of the RA 6337 when used in System configuration.

CHAPTER 6

SIMPLE FAULT LOCATION

The following procedure is intended as a guide to determine the location of possible faults in the receiver and is based on simple listening tests and observations.

1. Turning the RF/IF gain control while observing the RF level meter reading from approximately zero with the control fully clockwise to approximately full scale with the control fully counter-clockwise. This will generally indicate the presence of correct voltages on the B minus and AGC lines.

2. Assuming the receiver is not completely dead, some noise should be heard in the headset when the RF and AF gain controls are set to maximum.

3. The receiver calibrator, 1 mc oscillator, IF amplifiers, Detector, BFO and AF stages can be checked with the function switch set to the Check BFO position. A beat note should be heard which varies in pitch according to the setting of the BFO controls and in amplitude in accordance with the gain control settings.

4. It should be possible to set the AF level control so that 1 mw is indicated on the AF level meter with the line output terminated by a 600 ohm load.

5. The relative IF sensitivities can be checked for each position of the bandwidth switch.

6. The complete interpolation receiver can be checked with the function switch in the Calibrate position -- a beat note should be heard as the second VFO (KC control) is tuned through each 100 kc point (DET-BFO mode switch set to AM).

7. As the first VFO is tuned through each Mc position the receiver noise output should increase; indicating that the first VFO, 37.5 mc generator, and second mixer are operating.

8. Connecting an antenna and tuning the input by setting the RF range and RF tune controls should result in an increase in signal (or noise) as the RF tune control is peaked at the tuned frequency.

9. Absence of a D.C. path between the antenna connection and ground may indicate a blown antenna protection fuse.

CHAPTER 7

TEST EQUIPMENT REQUIRED FOR MAINTENANCE

The following test equipment will be required to perform the maintenance procedures described in this portion of the manual.

(1) Telephone Headset (Low impedance) 600 Ohm

(2) R.F. Signal Generator (Hewlett -Packard 606A) capable of operating in the frequency range 1 - 45 mc, with an adjustable output from 0.1 microvolt to volt. Output impedance: 50-75 ohms.

(3) Audio Signal Generator (Hewlett-Packard 200AB) with a range of 100 cps to 15 kc.

(4) Vacuum Tube Voltmeter (Hewlett-Packard 400D) capable of measuring 1.0 mv to 4.0 volts rms, with a frequency range from d.c. to 2 mc.

(5) AF Output Power Meter (General Radio 1840-A) 50 cps to 15 kc, -40 db to + 15 db.

(6) Frequency Counter (Beckman Model 6146) 50 c/s to 70 mc range, sensitivity: 100 mv or better.

(7) Noise Generator (Marconi TF1106/1) range: 1-30 mc; adjustable diode type calibrated in noise figure up to 10 db.

(8) Wave Analyzer (Hewlett-Packard 302A) frequency range: 50 c/s to 15 kc; capable of measuring to 40 db minimum.

(9) Oscilloscope (Hewlett-Packard 120B)

(10) General Purpose Multimeter (Simpson 260)

(11) RF Voltmeter (Boonton Electronics Model 91H)

(12) Sweep Generator 4-7 mc

(13) Logarithmic Amplifier, Jerrold 5100 or equal

CHAPTER 8

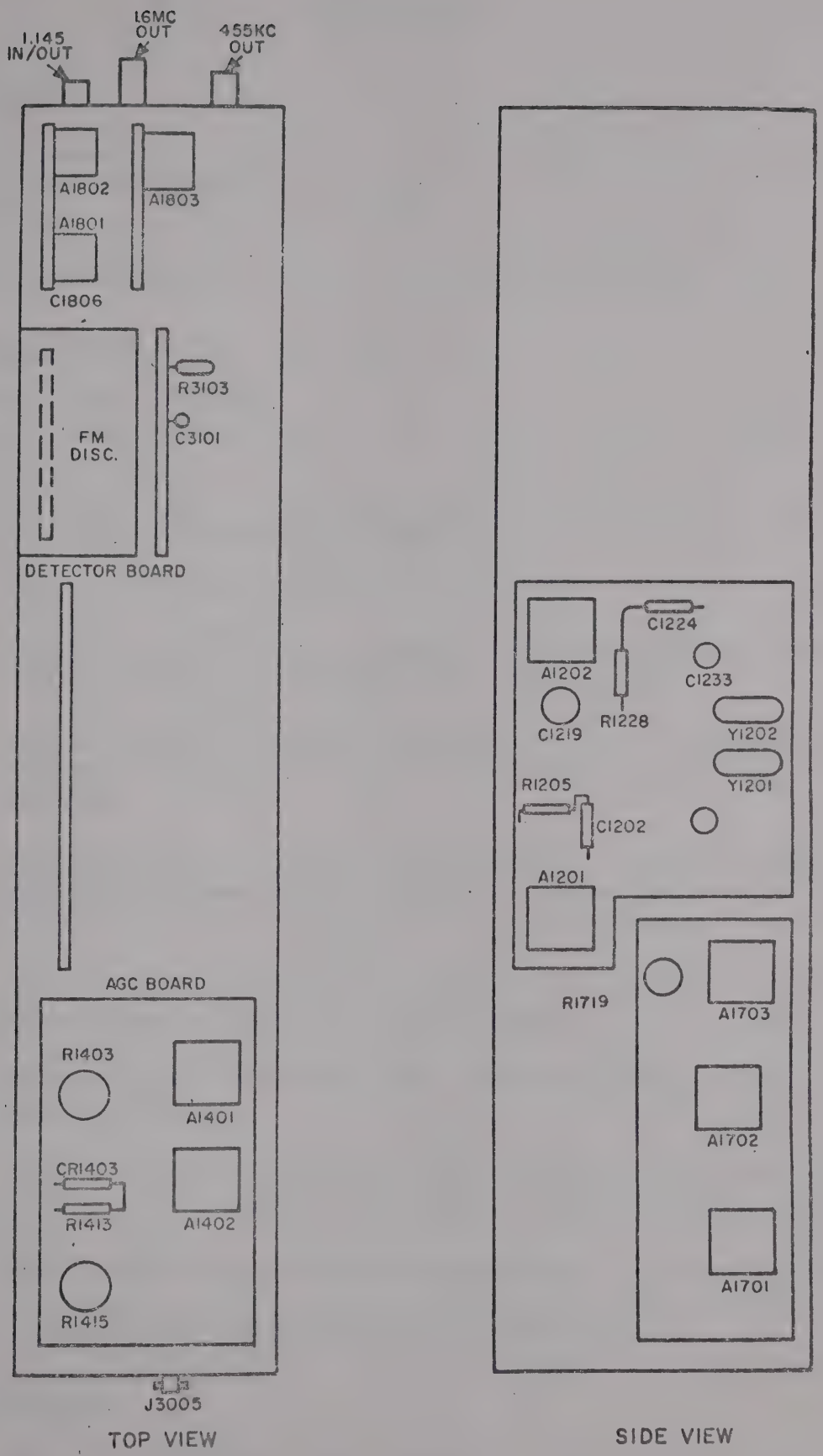
ALIGNMENT PROCEDURES

General Information

Under normal conditions the receiver will maintain the factory alignment over a long period of time, consequently any other causes of trouble should be eliminated before realignment is undertaken. If it becomes necessary to re-align any part of the receiver only small angular adjustments of any trimmers or tuning slugs should be necessary. When replacing access covers, module shields, etc., ensure that all screws are tightly secured to prevent any spurious signal from affecting the receiver.

PROCEDURES

1. IF package
2. Third Mixer
3. Second Mixer
4. 1 mc and 37.5 mc Modules
5. 37.5 mc Filter
6. First Mixer and 40 mc Filter
7. Second VFO
8. First VFO (Replaced by the MA 6358 in Series B and D Receivers)
9. RF Module



IF ASSEMBLY ALIGNMENT PARTS LOCATION.

ALIGNMENT PROCEDURE RA.6217

IF Package

Test Equipment

Signal Generator
Vaccum Tube Voltmeter
Oscilloscope
RF Voltmeter
Frequency Counter

Switch Positions

Function Switch - Manual
Manual Gain set at maximum
Mode Switch- AM

Procedure -2nd, 3rd, and 4th IF Amplifiers

(1) Connect the signal generator to the RF input on the IF module, J-3005.

(2) Connect a DC VTVM to the junction of CR1403 and R1413 on the AGC board. Set the system switch to the AGC position.

(3) Tune the signal generator to 1.6 mc and adjust the output for a reading of -6.5 volts on the DC voltmeter with the IF gain set at maximum.

(4) Tune transformer A1 and A2 on the second, third and fourth amplifier board for maximum on the voltmeter. Adjust the output of the signal generator to maintain an output of approximately -6.5 volts.

(5) Adjust transformers A1401 and A1402 on the AGC board for maximum, maintaining -6.5 volts on the DC voltmeter.

(6) Connect the RF voltmeter to the junction of C1202 and R1205 on the detector board.

(7) With the signal generator set to 100 microvolts input level, adjust A1703 on the IF amplifier for maximum on the RF voltmeter.

(8) Adjust R1719 on the IF amplifier board for 8 mv on the RF voltmeter.

(9) Remove the RF voltmeter from the detector board.

AGC Amplifier

(1) Leave the signal generator connected to the RF input on the IF package.

Set the generator attenuator to minimum. Switch receiver to AGC, long time constant and connect a 75 ohm resistor across the 1.6 mc output at the rear of the package.

(2) With no signal input, connect the DC VTVM to the AGC buss at terminal E1413 and adjust R1415 for -4.0 volts on the AGC buss.

(3) Disconnect the DC VTVM from the AGC buss and connect it to the junction of CR1403 and R1413 and increase the generator signal until -6.5 volts is read on the DC VTVM.

(4) Adjust A1401 and A1402 for maximum. The manual gain control may have to be decreased in order to maintain a voltmeter reading.

(5) Set the manual gain to maximum and set the signal generator for 100 uv output.

(6) Connect the DC VTVM to the AGC buss and adjust R1403 until the -4.0 volts begins to go slightly positive. The correct adjustment is reached when any increase in the signal generator power causes the AGC voltage to go positive. This adjustment may have to be re-set for the overall receiver test.

Detector Board

(1) Connect the signal generator at 1000 uv output to the RF input of the IF package. Set the AGC switch on, the manual gain control at maximum.

(2) Set the signal generator to 1.6 mc with 30% AM modulation at 1000 cps.

(3) Connect the oscilloscope to the AM detector at the rear of the IF package being sure that the AM detector is connected to the AM detector load.

(4) Adjust A1201 for maximum output.

(5) Connect the counter to the 1.6 mc output and adjust the frequency of the signal generator for 1.6 mc.

(6) Disconnect the counter from the 1.6 mc output and connect the counter to the audio frequency output.

(7) Switch the detector switch to +1.5 kc and adjust C1233 for a +1.5 kc output.

(8) Switch the detector switch to -1.5 kc and adjust C1228 for -1.5 kc output.

(9) Connect the DC VTVM to the junction of R1228 and C1224 on the detector board.

(10) Adjust the BFO fine tune for -7.4 volts on the VTVM.

(11) Switch the detector switch to 0 kc and adjust C1219 for 0 on the counter. Do not adjust A1202 as this has been pre-set at the factory.

(12) Switch the detector switch through the other BFO ranges and check that the total BFO range is ±8 kc.

(13) Disconnect the VTVM.

Converter

(1) Connect the frequency counter to the 1.145 mc (1.5mc) output (J3003); adjust C1806 for 1.145 mc (1.5mc).

(2) Connect the signal generator to the RF input of the IF package and tune to 1.6 mc. Set the generator output to 1000 uv and the receiver in the AGC position.

(3) Connect the RF voltmeter with 50 ohms across the meter to J3002 455 kc output and adjust A1801, A1802 and A1803 for maximum output at 455 kc. The output should be greater than 150 mv into a 50 ohm load. For alternate units the output is 100 kc.

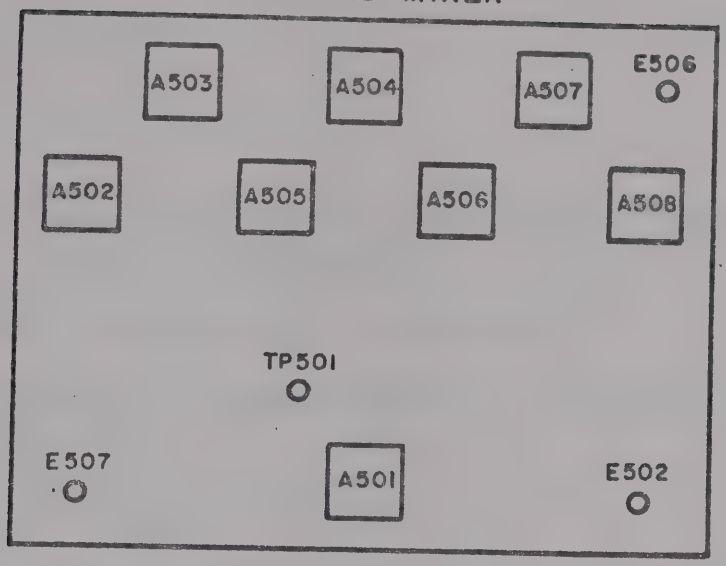
FM Insertion Oscillator and FM Discriminator

(1) Connect the RF voltmeter to the junction of R3103 and C3101 and switch the mode switch to the FM position. Check that the output is at least 100 mv.

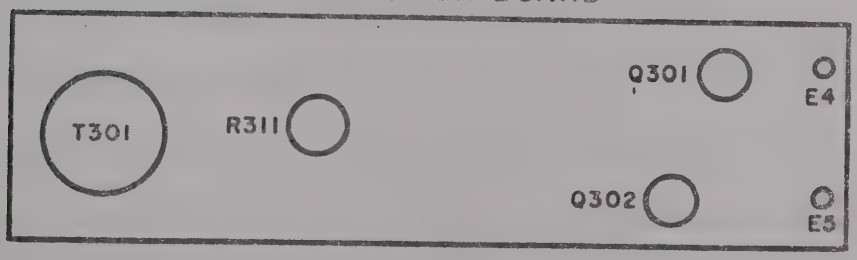
(2) Connect the signal generator at 1.6 mc to the RF input on the IF package (J3005) and switch the receiver to AGC.

(3) Connect the oscilloscope to the junction of R2920 and C2916 and adjust R2913 (linearity) so that when the generator is shifted ±6 kc the DC output from the discriminator varies. 25 volts DC peak-to-peak.

A. SECOND MIXER



B. FIRST MIXER BOARD



IST AND 2D MIXER ALIGNMENT
PARTS LOCATION.

ALIGNMENT PROCEDURE RA. 6217

Second Mixer

Test Equipment:

Signal Generator
RF Voltmeter

Switch Positions

Function Switch - Manual
1st VFO - 00 mc

Procedure

(1) Remove the 1 mc crystal from the 1 mc module. Connect RF voltmeter to TP 501. Connect the signal generator to E502.

(2) Set the signal generator to 37.5 mc at 1200 uv.

(3) Tune coil A501 for maximum on voltmeter. The output should be approximately 30 mv.

(4) Connect the RF voltmeter to E506.

(5) Connect the signal generator to the 2-3 mc input on the rear panel.

(6) Set the signal generator to 3.66 mc and tune A503 for a minimum.

(7) Set the signal generator to 1.6 mc and tune A504 for a minimum. The signal generator attenuator may have to be increased as the minimum is approached to obtain a reading on the voltmeter.

(8) Set the signal generator to 1.3 mc and tune A507 for a minimum.

(9) Set the signal generator to 4.5 mc and tune A506 for a minimum.

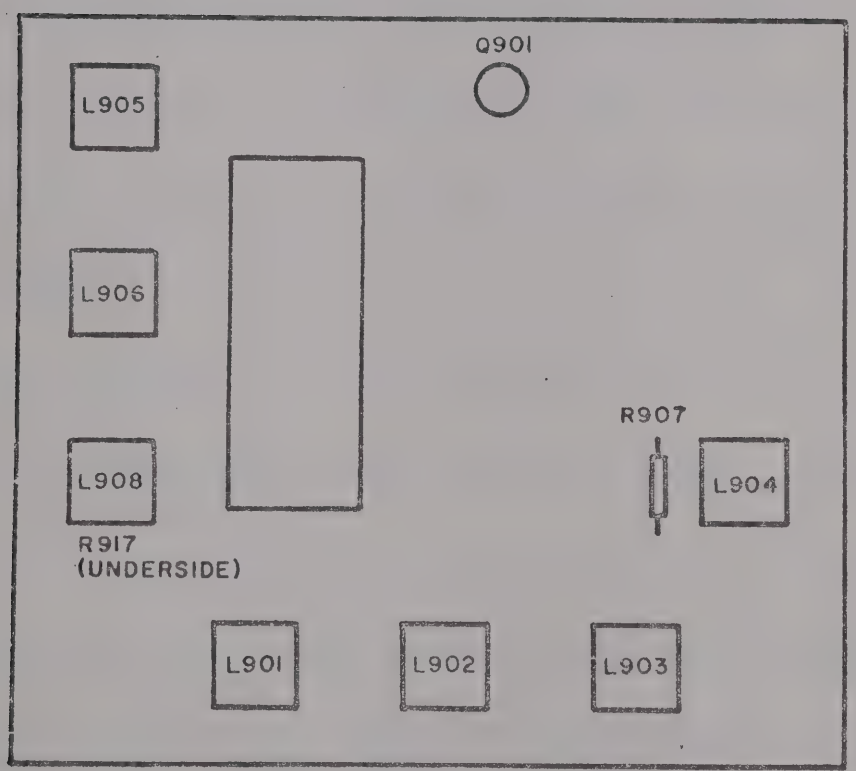
(10) Set the signal generator to 2.5 mc and tune coils A502 and A508 for maximum.

(11) Set the signal generator to 2.1 mc and tune A505 for a maximum.

(12) Repeat steps 6 thru 11 until a response is obtained which is flat within 3 db from 2 to 3 mc.

(13) Set the signal generator to 2.5 mc at 60 mv input and check that the output on the RF voltmeter is approximately 10 mv.

THIRD MIXER - TOP VIEW



3D MIXER ALIGNMENT PARTS LOCATION.

Test Equipment:

Signal Generator
RF Voltmeter

Switch Positions

Function Switch - Manual
2nd VFO - External
1st VFO - set at 00 mc

Procedure

(1) Connect the signal generator to the 2nd VFO input on the rear panel.

(2) Connect the RF voltmeter across R907.

(3) Set the generator to 5.6 mc and set the attenuator on the generator for a convenient reading on the RF voltmeter (50 mv).

(4) Tune coil L903 for a minimum on the RF voltmeter.

(5) Set the generator to 3 mc and tune L902 for minimum on the RF voltmeter.

(6) Set the generator to 3.6 mc and tune L901 for maximum on the RF voltmeter.

(7) Set the generator to 4.6 mc and tune L904 for maximum on the RF voltmeter.

(8) Repeat the above procedures until the response is flat within 3 db from 3.6 to 4.6 mc.

(9) Connect the signal generator to the 2-3 mc input on the rear panel.

(10) Connect the RF voltmeter to the junction of R915 and CR901.

(11) Set the generator to 3 mc and set the attenuator on the generator for 50 mv on the RF voltmeter.

(12) Tune coil L908 for maximum on the RF voltmeter.

(13) Tune the generator from 2-3 mc and check that the output does not vary more than 3 dB.

(14) Switch to Internal VFO and set to 500 kc indication.

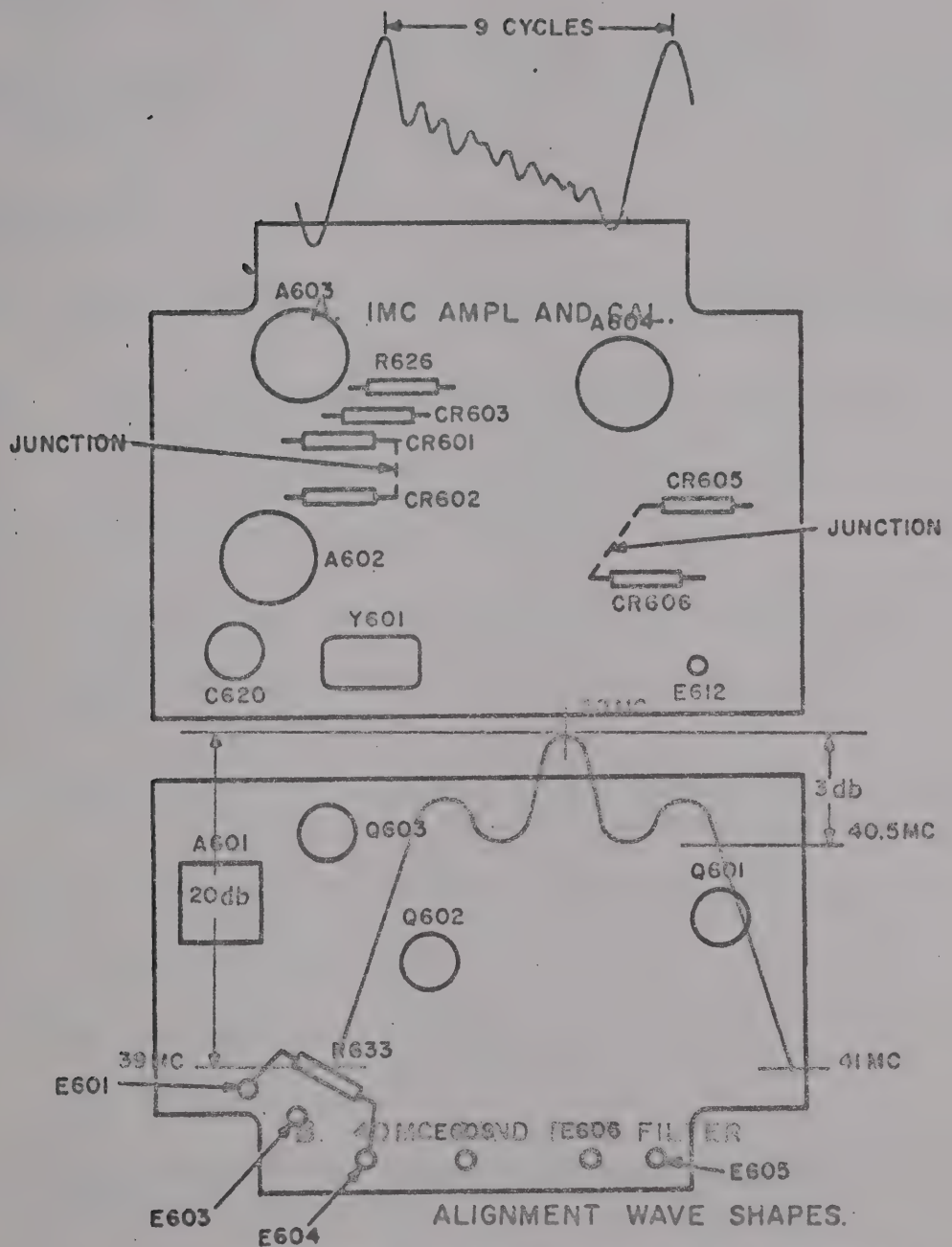
(15) Tune the signal generator connected to the 2-3 mc input to 2.5 mc at 100 uv.

(16) Connect the RF voltmeter to the base of Q901.

(17) Tune coil L905 and L906 for maximum on the RF voltmeter.

(18) Connect the RF voltmeter to terminal E904.

(19) Check that 10mv at 2.5 mc produces approximately 10 mv at the output E904 on the RF voltmeter.



IMC AMPL. AND CALIBRATOR ALIGNMENT PARTS LOCATION.

ALIGNMENT PROCEDURE RA. 6217

1 mc Module & 37.5 mc Module

Test Equipment

Signal Generator
RF Voltmeter
Frequency Counter
Oscilloscope

Switch Position

Function Switch - Manual

Procedure

(1) Insert the 1 mc crystal and check for approximately 120 mv at terminal E612.

(2) Connect the frequency counter to the 1 mc output on the rear panel.

(3) Adjust the frequency to 1 mc with capacitor C620.

(4) Connect the RF voltmeter to E601.

(5) Adjust the coil assembly A601 for maximum, approximately 4 volts.

(6) Connect the RF voltmeter to E603 and check that the 1 mc level is approximately 120 mv.

(7) Remove the crystal, connect the signal generator to 1 mc input on rear panel and tune the generator to 1 mc with the input level at 100 mv.

(8) Check that the level at E612 is approximately 100 mv.

(9) Replace the crystal.

(10) Connect oscilloscope to E618.

(11) Switch to CAL. Mode.

(12) Observe that the 10.1 Digital Divider is operating and that the output waveform is approximately 250 mv peak to peak.

LOWER BOX - 37.5 mc MODULES

(1) Connect the RF voltmeter to E701. This point should measure 1.4 volts at 1.0 mc.

(2) Disconnect the lead to the low pass filter at E704 and connect a 390 ohm resistor in series with the signal generator to this point.

(3) Set the signal generator to a reference level of 250 mv at 1mc. Tune the generator until the response falls; peak trimmer capacitors C708, C710, C713 and C715. Continue this process until 32 mc is reached.

(4) Check that the output is 100 mv with a 2 db ripple across the passband (2 - 32 mc).

(5) Connect the signal generator to the coaxial cable at E709, and connect the RF voltmeter to R710.

(6) Set the generator to 37.5 mc at 3 mv and tune coil A701 to 37.5 mc. Check that at least 30 mv appears at E701.

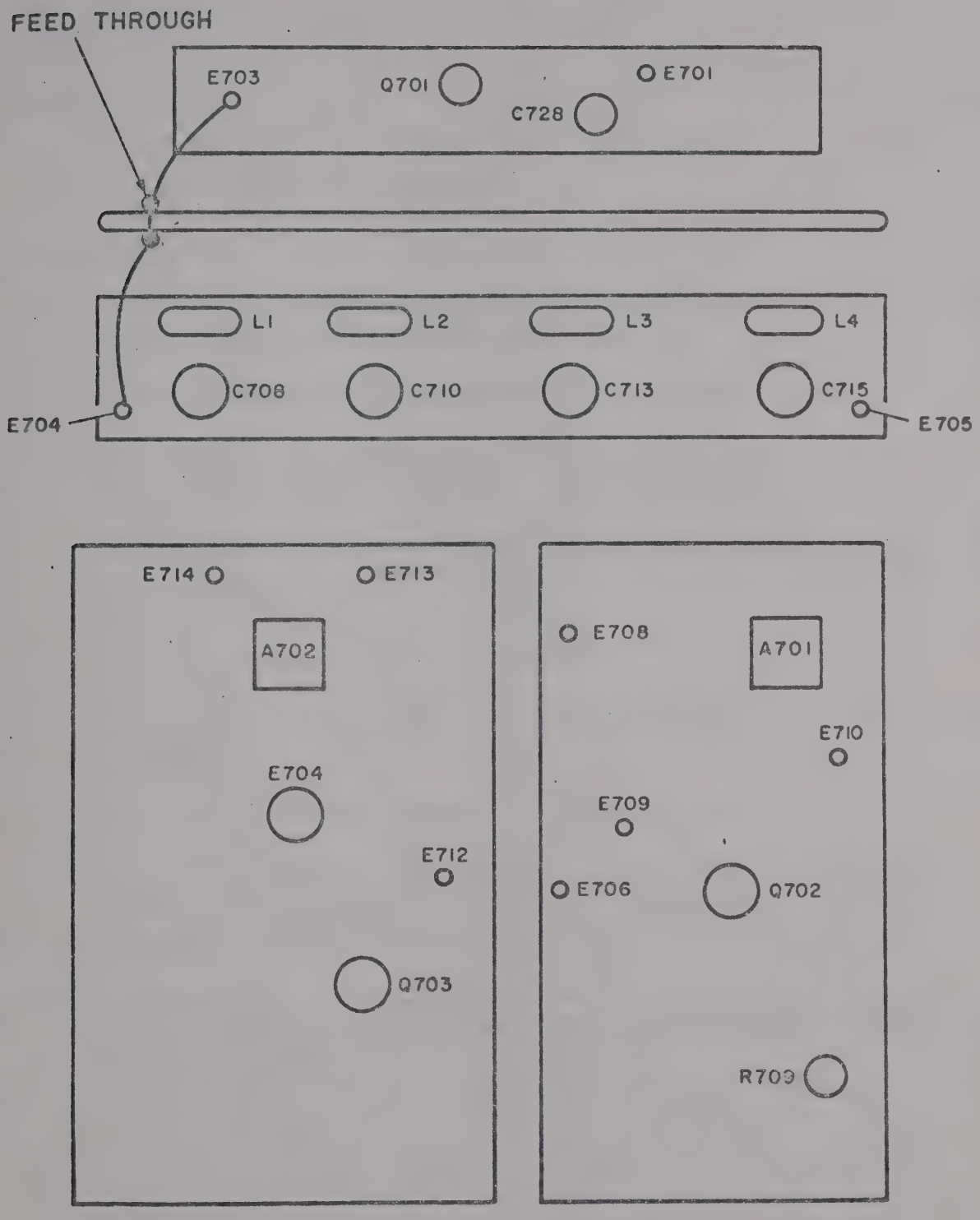
(7) Connect the RF voltmeter to E713 and tune A702 for approximately 100 mv.

(8) Insert the 1 mc crystal and connect the RF voltmeter to E706. Check that approximately 2 volts appears at this point.

(9) Set the signal generator to 37.5 mc and connect it to J11 (first VFO output to the calibrator).

(10) Connect the RF Voltmeter to E710.

(11) Adjust R709 for a minimum on the RF voltmeter.



37.5 MC GENERATOR ALIGNMENT
PARTS LOCATION.

Alignment Procedure RA. 6217
37.5 mc Filter

Test Equipment:

Signal Generator
RF Voltmeter

Switch Position

Function Switch-Manual
1st VFO- set between any mc point

Procedure

(1) Connect the signal generator to the coaxial connector J111, underside of receiver, and remove the 1 mc crystal.

(2) Connect the RF voltmeter to TP501 on the second mixer.

(3) Set the signal generator 37.5 mc with enough output to obtain a reading on the RF voltmeter. NOTE: If no output is obtained it may be necessary to attach the RF voltmeter to the 2nd coil (L802) from the input and peak the first coil, continuing down the 37.5 mc BPF until the output can be read at TP501 on the second mixer.

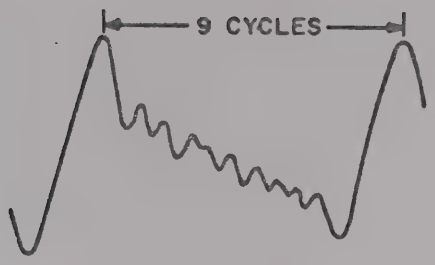
(4) Peak all coils on the 37.5 mc BPF.

(5) Adjust R709 on the harmonic mixer for a minimum 37.5 mc signal at TP501.

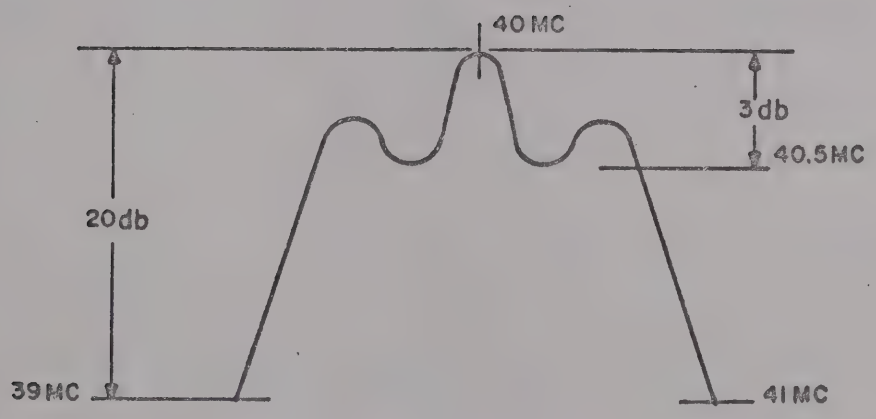
(6) Remove the signal generator and replace a 1 mc crystal.

(7) Tune the first VFO until a peak is reached on the RF voltmeter at 1 mc. Peak all coils in the 37.5 mc chain, including the 37.5 mc coils on the 1 mc and 37.5 mc generator module and on the second mixer module.

(8) Tune the first VFO to all the mc positions and check that there is at least 30 mv at all positions. The output should dip between all the mc positions.



A. IMC AMPL AND CAL.



B. 40MC BAND PASS FILTER

ALIGNMENT WAVE SHAPES.

Alignment Procedure RA.6217
1st Mixer and 40 mc Filter

Test Equipment

Sweep Generator
Signal Generator
RF Voltmeter
Oscilloscope
Log Amplifier

Switch Positions

Function Switch - Manual
RF Range - Wideband
1st VFO - not on 00 mc

Procedure

(1) Connect the sweep generator to the antenna input.

(2) Remove the cover of the 2nd mixer.

(3) Connect a 5 pf capacitor in series with the log amplifier and oscilloscope and connect this to E507 on the second mixer board.

(4) Tune the first VFO to 5 mc and adjust the sweep generator to show a suitable trace. Connect a suitable marker at 40 mc (loosely coupled generator).

(5) Adjust the coils in 40 mc BPF to produce the waveform shown below.

(6) Set the signal generator to 40 mc and connect it to J112 (first VFO output to 1st mixer).

(7) Connect the RF voltmeter to E507 on the second mixer board.

(8) Set the attenuator on the signal generator for a reading on the RF voltmeter.

1st Mixer and 40 mc Filter (Continued)

(9) Adjust R311 on the first mixer board for a minimum on the voltmeter. Disconnect the signal generator and the RF voltmeter and reconnect J112.

Alignment Procedure RA.6217
1st VFO

Test Equipment:

Frequency counter (70 mc)
RF Voltmeter

Switch Positions

Function Switch - Manual
1st VFO - not on 00 mc

Procedure

(1) Disconnect connectors J111 and J112 on underside of receiver and measure the output from the 1st VFO with the RF voltmeter. This reading should be approximately 200 mv.

(2) Connect the counter to J111 and tune the first VFO to 1 mc. The measured frequency should be 41.5 mc. If this frequency is not obtained, adjust the mechanical coupling to variable capacitor C1 to produce the correct frequency. The coil L1 in the first VFO has been locked and should not be adjusted unless absolutely necessary.

(3) Tune the first VFO to 30 mc and check that the measured frequency on the counter is 70.5 mc.

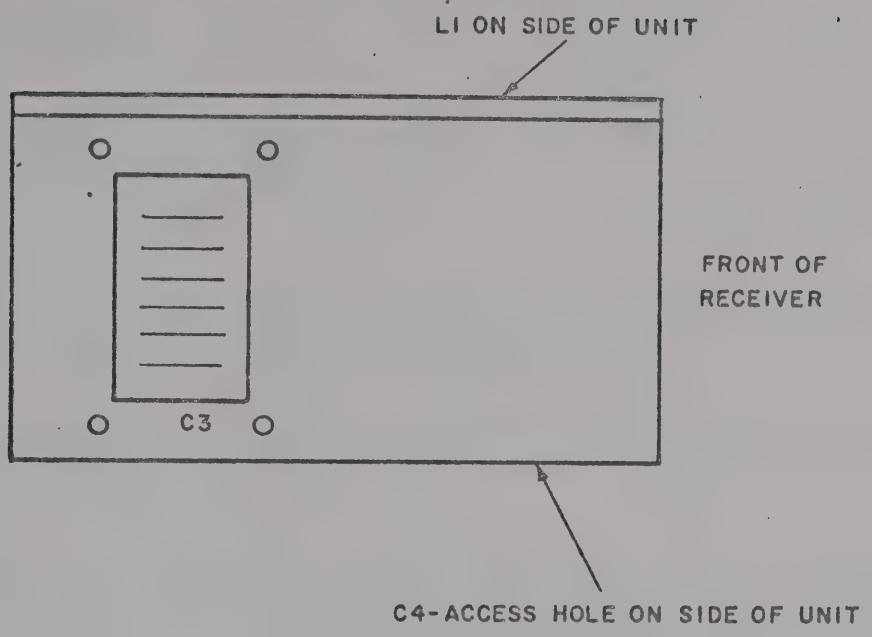
(4) Adjust capacitor C3 if the measured frequency is incorrect.

(5) Repeat steps 3 and 4 until both ends of the frequency range are within ±50 kc.

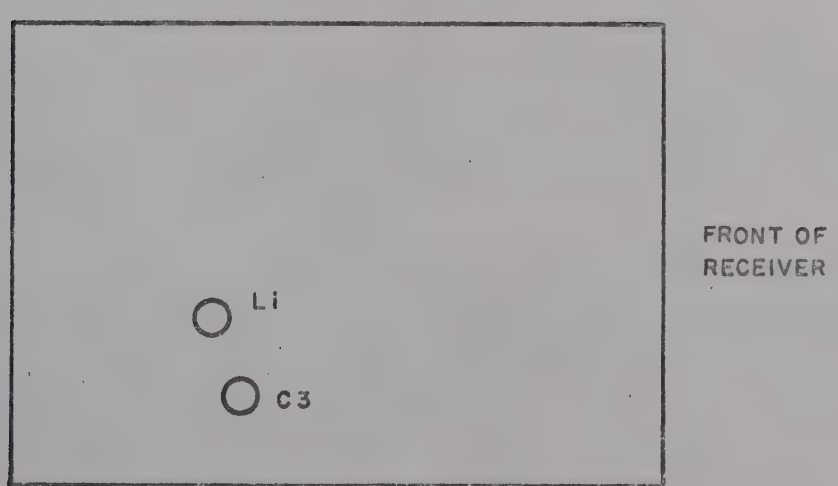
(6) Tune the 1st VFO through all the frequencies and record the frequencies measured on the counter. The frequencies should be within ±50 kc of thedesired frequency, i.e. 40.5 mc plus the receiver dial frequency equals the frequency on the counter. If an error is found in the middle of the band, the individual blades on the variable capacitor C1 will have to be adjusted. When all frequencies are correct, the alignment of the first VFO is completed.

NOTE: The above procedure is accomplished while ensuring that the MC numbers tuned are centered in the escutcheon window opening.

A. SECOND VFO - TOP VIEW



B. FIRST VFO - TOP VIEW



1ST AND 2D VFO ALIGNMENT PARTS LOCATION.

Alignment Procedure RA. 6217
2nd VFO

Test Equipment:

Frequency Counter
RF Voltmeter

Switch Positions

2nd VFO- Internal
Function Switch - Manual
Fine tune control in middle of range

Procedure

(1) Connect the RF voltmeter to the 2nd VFO output on rear panel. The output should be greater than 250 mv.

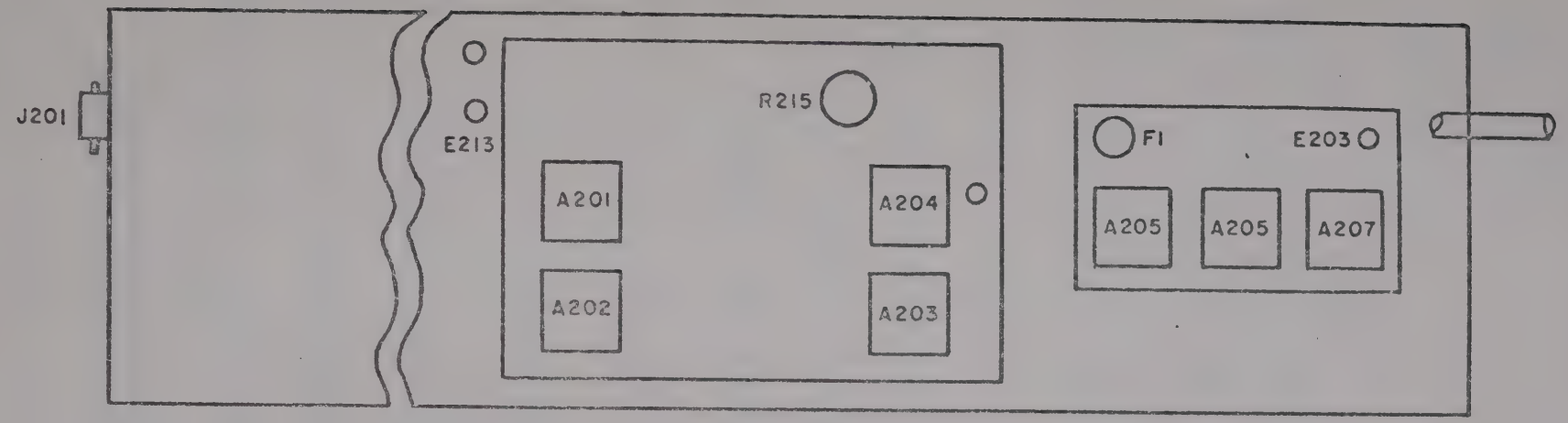
(2) Connect the counter to the 2nd VFO output and set the 2nd VFO to 1000 kc. The frequency measured on counter should be 3.6 mc ±500 cycles.

(3) Set the 2nd VFO to 0 kc and measure the frequency with the counter. The frequency should be 4.6 mc ± 500 cycles. If the frequency is incorrect, adjust the trimmer capacitor C4 at the high end of the band.

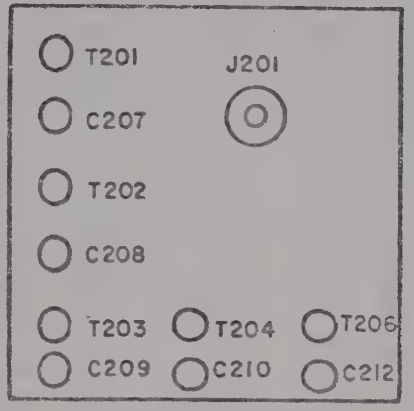
(4) Return the 2nd VFO to 1000 kc. Adjust mechanical coupling to C3 for the correct frequency. Repeat steps 3 and 4 until the correct frequency is obtained at both ends of the band. Do not adjust coil L1 as it has been locked in place and no adjustment of this coil should be necessary.

(5) When both ends of the band are at the correct frequencies, tune the 2nd VFO to each 100 kc point on the dial. If the frequency varies from the desired frequency (i.e. 4.6 - frequency on dial ±500 cycles) the individual blades on C3 may have to be adjusted. This should not be necessary in most cases.

(6) When all frequency points on the dial are correct, set the function switch to calibrate and check for a zero beat at all 100 kc points on the dial. Also, tune the fine tune control and note that the frequency of the VFO varies approximately 8 kc from one end of the fine tune control to the other.



REAR VIEW



RF UNIT

RF UNIT ALIGNMENT PARTS LOCATION.

Alignment Procedure RA. 6217
RF Module

Test Equipment:

RF Voltmeter
Signal Generator
DC Voltmeter

Switch Positions

Function Switch - Manual
1st VFO - not on 00 mc
Antenna Range - Wideband
RF Attenuator - Minimum
IF Gain Control - Maximum

Procedure - Refer to Dwg. G-02022

(1) Connect the signal generator to the antenna input J201.

(2) Connect the RF voltmeter to terminal E203 on the 30 mc low pass filter.

(3) Insure that-4 volts is present on AGC terminal E213.

(4) Set the signal generator for a 10 mv output at 37.5 mc and adjust coils A205 and A207 for minimum on the RF voltmeter.

(5) Re-set the signal generator to 47.0 mc and adjust coil A206 for a minimum on the RF voltmeter.

(6) Connect the RF voltmeter to terminal E207 and set the signal generator to 30 mc.

(7) Adjust coils A201, A202, A203, and A204 for a maximum at 30 mc, the output should be down 40 db at 40 mc. (at least)

(8) Tune the generator across the pass band and insure that the output measured on the RF voltmeter does not vary more than 4 db.

(9) With the signal generator set at 5.5 mc and an input level of 3 mv, the output at terminal E207 should be greater than 30 mv.

(10) Adjust the manual IF gain control until -2 volts appears at terminal E213 (AGC buss).

(11) Adjust potentiometer R215 so that the output is 20 db down from the maximum gain condition (i.e. -4 volts AGC).

(12) Set the antenna range switch to the 1-2 mc position.

(13) Re-set the IF gain to maximum (-4 volts).

(14) Set the signal generator for an output of 10 mv at 850 kc.

(15) Remove the outer slug from transformer T201 and adjust the inner slug from the bottom of the coil to the first maximum on the RF voltmeter. Insure that the antenna tuning capacitor is set for maximum capacitance.

(16) Insert the outer slug and tune it for maximum.

(17) Re-set the generator to 2 mc and adjust the antenna tuning control for maximum.

(18) Adjust trimmer capacitor C207 for maximum at 2 mc.

(19) Repeat this procedure (steps thru 18) for the remaining ranges by adjusting the corresponding tuning slugs and capacitors listed below:

Range 2-4

T202 at 1.45 mc
C208 at 4.0 mc

Range 4-8

T203 at 2.8 mc
C209 at 8.0 mc

Range 8-16

T204 at 6.5 mc
C210 at 16.0 mc

Range 16-30

T205 at 13.5 mc
C212 at 30.0 mc

This completes alignment of RF module.

RA. 6217 SCHEMATIC DIAGRAMS AND PARTS LISTS

SERIES NUMBER	DESCRIPTION	DRAWING NUMBER A MODEL	C MODEL
100	Main Chassis	G-01310	G-02469
200	R.F. Unit	G-02022	G-02396
300	1st Mixer & 40 mc Filter	G-01304	
400	1st VFO	G-01308	
500	2nd Mixer	G-01301	
600	1 mc Module & Calibrator	G-03412	
700	37.5 mc Generator	G-01303	
800	37.5 mc Filter	G-01305	
900	3rd Mixer	G-01302	G-02291
1000	2nd VFO	G-01309	
1100			
1200	Product Detector	G-01504	
1300	Power Unit (MA 6302)	G-01311	
1400	AGC	G-01500	
1500	Audio Amplifier	G-01499	
1600	1st 1.6 mc IF Amplifier	G-01505	
1700	2nd, 3rd, 4th IF Amplifiers	G-01501	
1800	455 kc Converter	G-01592	
1900	Emitter Follower, Meter Zero	G-01758	
2900	FM Discriminator	G-02027	
3000	IF Package	G-02028	
3100	FM Insertion Oscillator	G-02030	
3200	Crystal Filter & IF Assembly	G-01310	
100	DC - DC Converter (MA 6301)	G-02449	
100	AC Power Unit/Battery Charger (MA 6300)	G-02535	

ORDERS FOR SPARE PARTS

When ordering spare parts, it is recommended that users include the following information:

(1) Type and serial number of equipment.

(2) Circuit reference, description and manufacturer of part required.

(3) Quantity required.

Note:
"C" Version Drawings are the same as those in the "A" Version except where noted in Column "C".

RA. 6217 PARTS LISTS

CONTENTS

SERIES #	DESCRIPTION	ASSEMBLY PART #
100	Main Chassis	A-02086
200	R. F. Unit	A-02019
300	1st Mixer and 40 mc Filter	A-01321
400	1st VFO	A-01317
500	2nd Mixer	A-01627
600	1 mc Module and Calibrator	A-01326
700	37.5 mc Generator	A-01324
800	37.5 mc Filter	A-01320
900	3rd Mixer	A-02290
1000	2nd VFO	A-01316
1200	Product Detector	A-01666
1300	Power Unit (MA 6302)	A-02088
1400	Automatic Gain Control (AGC)	D-01657
1500	Audio Amplifier	D-01502
1600	1st IF Amplifier (1.6 mc)	A-02054
1700	2nd, 3rd, 4th IF Amplifier	A-02034
1800	455kc Converter	A-02048
1900	Emitter Follower, Meter Zero	A-01774
2900	FM Discriminator	A-02026
3000	IF Package	A-02028
3100	FM Insertion Oscillator	A-02031
3200	Crystal Filter & IF Assembly	A-02087-1
100	DC-DC Converter (MA6301)	A-02472
100	AC Power Unit/Battery Charger (MA 6300)	A-02538

NOTE:

1. Starting with an 'A' model receiver whose serial number is between 350 and 370, the rear panel Connectors will be changed from miniature coaxial (Micon 1005) to BNC (UG 1094/U) types.

2. When ordering SPARE PARTS for equipments it is recommended that users include the following informations

   a. Type and Serial Number of equipment.
   b. Assembly number if ordering complete assemblies or sub-assemblies.
   c. Circuit reference, description and part number if ordering component parts.
   d. Quantity required.

RA. 6217A MODULE SUB-ASSEMBLIES

The following list is a breakdown by module and sub-assemblies within each module. These assemblies may be procured by reference to their assembly part numbers.

Ckt. Ref.	Description	Assembly Part Number
MAIN CHASSIS ASSEMBLY		A-02086
TB101	Terminal Board, 8 position	Cinch Jones 351-28-08-001
R.F. AMPLIFIER MODULE		A-02019
TB201	P.C. Board, Antenna Filter	A-02589
TB202)	A208, Antenna Tuned Circuits	A-02591
TB203)		
TB204	P.C. Board, R.F. Amplifier	A-02590
	R.F. Attenuator Switch	A-02841
1st MIXER & 40 MHz FILTER MODULE		A-01321
TB301	P.C. Board, 1st Mixer	A-02555
TB302	P.C. Board, 40 MHz Filter	A-02556
1st V.F.O. MODULE		A-01317
TB401	P.C. Board Assembly	A-02566
TB402	P.C. Board Assembly	A-02567
TB403	P.C. Board Assembly	A-02568
SECOND MIXER MODULE		A-01627
TB401	P.C. Board Assembly	A-02562
1 MHz OSCILLATOR, CALIBRATOR /37.5 MHz GENERATOR MODULE		B-03431
1 MHz Module & Calibrator		A-01326
TB601	P.C. Board, 1 MHz Amplifier	A-02574
TB602	P.C. Board, Calibrator	A-03407
37.5 MHz Generator		A-01324
TB701	P.C. Board Assembly	
	Harmonic Generator	A-02569

Ckt. Ref.	Description	Assembly Part Number
	TB702 P.C. Board Assembly, Harmonic Low Pass Filter	A-02570
	TB703 P.C. Board Assembly, Harmonic Mixer	A-02571
	TB704 P.C. Board Assembly, 37.5 MHz Generator	A-02572
37.5 MHz FILTER MODULE		A-01320
TB801	P.C. Board Assembly	A-02585-1
THIRD MIXER MODULE		A-01323
TB901	P.C. Board Assembly	A-02576-2
2nd V.F.O. MODULE		A-01316
TB1001	P.C. Board Assembly	A-02586
TB1002	P.C. Board Assembly	A-02587
POWER UNIT MODULE		A-02088
TB1301	P.C. Board Assembly	A-02584
TB1302	Power Transformer	D-01650
CRYSTAL FILTER & I. F. ASSEMBLY MODULE		A-02087-1
A1	1st I. F. Assembly	A-02054
A2	Emitter Follower & Meter Zero Assembly	A-01774
	Chassis, I. F. Control Assembly	D-01764
DC-DC CONVERTER (MA. 6301)		A-02472
TB101	P.C. Board Assembly	A-02584-1
TB102	P.C. Board Assembly	A-02853
TB103	Mtg. Board Transistor Assembly	A-02854
AC POWER UNIT/BATTERY CHARGER (MA.6300)		A-02538
TB101	P.C. Board Assembly	A-02584
TB102	Comp. Board Assembly	A-02916

Ckt. Ref.	Description	Assembly Part Number
AUDIO AMPLIFIER MODULE		A-01502
1st I.F. AMPLIFIER (4.6 MHz) MODULE		A-02054
TB1601	P.C. Board Assembly	A-02580
I.F. PACKAGE MODULE		A-02029
A3001	P.C. Board, 2nd, 3rd, & 4th I.F. Amplifier	A-02034
	TB1 P.C. Board Assembly (incl. in A-02034)	A-02837
A3002	P.C. Board, A.G.C.	A-01657
A3003	P.C. Board, Product Detector	A-01666
A3004	P.C. Board, F.M. Insertion Oscillator	A-02031
A3005	P.C. Board, F.M. Discriminator	A-02026
A3006	P.C. Board, 455 kc Converter	A-02048
	TB1801 P.C. Board #1 Assembly (incl. in A-02048)	A-02578
	TB1802 P.C. Board #2 Assembly (incl. in A-02048)	A-02579

RA6217 MAIN CHASSIS - 100 Series - Dwg. G-01310

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R101	Fixed Composition	68	5	1/4	RC07GF680J
R102	" "	68	5	1/4	RC07GF680J
R103	CAL/Fine Tune Potentiometer	500	5	2	Clarostat 62JA
R104	Fixed Composition	680	5	1/4	RC07GF681J
R105	" "	3K	5	1/4	RC07GF302J
R106	Potentiometer	1K	10	2	Ohmite CMU1021
R107	Fixed Composition	68K	5	1/4	RC07GF683J
R108	" "	120K	5	1/4	RC07GF124J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C101	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C102	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C103	Ceramic, Disc	.001uf	10	500	Centralab, CE-102 disc HIK
C104	Ceramic, Disc	.001uf	10	500	Centralab, CE-102 disc HIK
C105	Tantalum	2.2uf	10	20	Kemet K2R2J20KS
C106	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C107	Tantalum	.47uf	10	35	Kemet KR47J35KS
C108	Tantalum	6.8uf	10	35	Kemet K6R8J35KS
C109	Same as C101				
C110	Same as C103				
C111	Ceramic, Disc	.001uf	20	1000	CK60-AW-102M

CONNECTORS

J101	Jack to 2nd mixer	Cannon DBMF-9W4S
J101-A1	Right angle receptacle	Cannon DM53743-5000
J101-A2	Right angle receptacle	Cannon DM53743-5000
J101-A3	Right angle receptacle	Cannon DM53743-5000
J101-A4	Right angle receptacle	Cannon DM53743-5000
J102	1 MHz Output	UG1094/U
J103	1 MHz Input	"
J104	2-3 MHz Output	"
J105	2-3 MHz Input	"
J106	2nd VFO Input	"
J107	2nd VFO Output	"
J108	Head phone jack	Switchcraft C-11

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
J109	Socket - 15 contact	Cannon DAMF-15
J110	Jack to 3rd mixer	Cannon DBMF-9W4S
J110-A1	Right angle receptacle	Cannon DM53743-5000
J110-A2	Right angle receptacle	Cannon DM53743-5000
J110-A3	Right angle receptacle	Cannon DM53743-5000
J110-A4	Right angle receptacle	Cannon DM53743-5000
J111	1st VFO output to calibrator	Micon 1005
J112	1st VFO output to 1st mixer	Micon 1005
J113	1.6 mc output	Micon 1005
TB101	8 position terminal board	Cinch-Jones 351-28-08-001
AT101	Termination, resistive, 75 ohm	RCI B-03290
W101	Cable, Coaxial	RG 196A/U
P101	1 mc CAL & 37.5 mc Gen.	Cannon DBMF-9W4S
P101-A1	Right angle receptacle	Cannon DM53741-5000
P101-A2	Right angle receptacle	Cannon DM53741-5000
P101-A3	Right angle receptacle	Cannon DM53741-5000
P101-A4	Right angle receptacle	Cannon DM53741-5000
P102	2nd VFO	Cannon DBMF-9W4S
P102-A1	Right angle receptacle	Cannon DBMF-9W4S
P102-A2	Right angle receptacle	Cannon DBMF-9W4S
P102-A3	Right angle receptacle	Cannon DBMF-9W4S
SWITCHES		
S101	Rotary, SPDT	Oak 23
S102	Microswitch, DPST	Unimax USMF
S103	Microswitch, DPST	Unimax USMF
S104	Slide, DPDT	Oak 278
S105	On/Off power-part of S106	
S106A,B,C	3 deck, rotary	RCI C-01742
METER		
M101	0-200 D.C. microamps	RCI B-02545-1
DIAL LIGHTS		
DS101, 102	Bayonet base	GE #336
DIODE		
Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
CR101	Bridge, 4 way 10 ma	Conant, BU Series 160-U

RA6217 RF AMPLIFIER - 200 Series - Dwg. G-02022 ("A") or G-02396 ("C")

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R201	Fixed Composition	15	5	1/4	RC07GF150J
R202	" "	56	5	1/4	RC07GF560J
R203	" "	56	5	1/4	RC07GF560J
R204	" "	47	5	1/4	RC07GF470J
R205	" "	33	5	1/4	RC07GF330J
R206	" "	33	5	1/4	RC07GF330J
R207	" "	56	5	1/4	RC07GF560J
R208	" "	56	5	1/4	RC07GF560J
R209	" "	15	5	1/4	RC07GF150J
R210	" "	390	5	1/4	RC07GF391J
R211	" "	2.7K	5	1/4	RC07GF272J
R212	" "	220	5	1/4	RC07GF221J
R213	" "	4.7K	5	1/4	RC07GF472J
R214	" "	820	5	1/4	RC07GF821J
R215	Potentiometer	500		1/2	Beckman 52P-R500
R216	Fixed Composition	100	5	1/4	RC07GF101J
R217	" "	1.8K	5	1/4	RC07GF182J
R218	" "	2.2K	5	1/4	RC07GF222J
R219	" "	27	5	1/4	RC07GF270J
R220	" "	150	5	1/4	RC07GF151J
R221	" "	680	5	1/4	RC07GF681J
R222	" "	100	5	1/4	RC07GF101J
R223	" "	220	5	1/4	RC07GF221J
R224	" "	1.5K	5	1/4	RC07GF152J
R225	" "	150	5	1/4	RC07GF151J
R226	" "	1.2K	5	1/4	RC07GF122J
R227	" "	27	5	1/4	RC07GF270J
R228	" "	680	5	1/4	RC07GF681J
R229	" "	150	5	1/4	RC07GF151J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C201	Silver Mica	68pf	1	500	CD6C680G500
C202	" "	82pf	1	300	CD6F820G300
C203	" "	20pf	1	500	CD6C200J500
C204	Not Used				
C205	Same as C202				
C206	" "	68pf	5	500	Centralab CPR68J
C207	Ceramic, Variable	3.5-13pf			7S Triko T.C. N-470
C208	" "	3.5-13pf			7S Triko T.C. N-470
C209	" "	3.5-13pf			7S Triko T.C. N-470
C210	" "	3.5-13pf			7S Triko T.C. N-470

CAPACITORS (Continued)

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C211	Air, Variable	0-176pf			RCI B-02023
C212	Ceramic, Variable	3.5-13pf			7S Triko T.C. N-470
C213	Monolythic	0.1uf			Sprague 5C7-A
C214	Same as C213				
C215	Same as C213				
C216	Same as C213				
C217	Same as C213				
C218	Same as C213				
C219	Same as C213				
C220	Same as C213				
C221	Same as C213				
C222	Tantalum		10	35	Kemet KR47J35KS
C223	Same as C213				
C224	Same as C213				
C225	Same as C213				
C226	Same as C213				
C227	Not Used				
C228	"				
C229	"				
C230	"				

FUSE

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
F201	Ultrafast, Pigtail 500 MHz, 125V, 1/2 Amp	Littlefuse 279.500

DIODES

CR201	Diode 1N281
CR202	Diode 1N281
CR203	Diode 1N281
VR201	Diode 1N702

TRANSFORMERS

T201	1-2mc Transformer	RCI D-02828
T202	2-4mc Transformer	RCI D-02827
T203	4-8 mc Transformer	RCI D-02826
T204	8-16mc Transformer	RCI D-02825
T205	Wideband Transformer	RCI D-02961
T206	16-30mc Transformer	RCI D-02824

TRANSISTORS

Q201	2N2996
Q202	2N2964

TRANSISTORS (Continued)

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
Q203	2N2996	
Q204	2N2964	

SWITCHES

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
S201A&B	Antenna attenuator, 5 position	RCI C-01273
S202A,B,C, &D	RF Range, 7 position	RCI C-01615

CONNECTORS

J201	BNC receptacle, RF input (antenna)	UG-1094/U
W201	Cable, Coaxial	RG-196A/U

ARRESTOR

E201	Voltage surge arrestor	Siemens B1-A230

TUNED CIRCUITS

A201, 203	Coil Assembly	RCI D-01366
A202	" "	RCI D-01367
A205, 207	" "	RCL CT32963
A206	" "	RCI D-03041
A208	Ant. Tuned Circuits (TB202 and TB203)	

RA6217 1st MIXER & 40 MC FILTER - 300 Series - Dwg. G-01304

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R301	Fixed Composition	56	5	1/4	RC07GF560J
R302	Not Assigned				
R303	Fixed Composition	15K	5	1/4	RC07GF153J
R304	" "	82	5	1/4	RC07GF820J
R305	" "	15K	5	1/4	RC07GF153J
R306	" "	3.3K	5	1/4	RC07GF332J
R307	" "	56	5	1/4	RC07GF560J
R308	" "	56	5	1/4	RC07GF560J
R309	" "	2.2K	5	1/4	RC07GF222J
R310	" "	3.3K	5	1/4	RC07GF332J
R311	Potentiometer	2.5K	20		Centralab TMX0-252M
R312	Fixed Composition	1K	5	1/4	RC07GF102J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C301	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C302	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C303	Ceramic Disc	.001uf	20	1000	Centralab DD-102G
C304 to C307	Same as C301				
C308	Same as C303				
C309	Polystyrene	39pf	2.5	125	RCI 26808
C310	Polystyrene	39pf	2.5	125	RCI 26808
C311	Polystyrene	47pf	2.5	125	RCI 26809
C312 to C316	Same as C311				
C317	Polystyrene	56pf	2.5	125	RCI 26810
C318	Polystyrene	220pf	2.5	33	RCI 26817

INDUCTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
L301	Variable	RCI D-02974
L302 to L308	Variable	RCI D-02973

TRANSFORMER

T301	RF Transformer	RCI D-02935

TRANSISTORS

Q301, Q302 PNP Transistor 2N2996

RA6217 1st VFO - 600 Series - Dwg. G-01308

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	100	5	1/4	RC07GF101J
R2	" "	10	5	1/4	RC07GF100J
R3	" "	4.7K	5	1/4	RC07GF472J
R4	" "	6.8K	5	1/4	RC07GF682J
R5	" "	68	5	1/4	RC07GF680J
R6	" "	10K	5	1/4	RC07GF103J
R7	" "	68	5	1/4	RC07GF680J
R8	" "	1.5K	5	1/4	RC07GF152J
R9	" "	8.2K	5	1/4	RC07GF822J
R10	" "	5.6K	5	1/4	RC07GF562J
R11	" "	10K	5	1/4	RC07GF103J
R12	" "	4.7K	5	1/4	RC07GF472J
R13	" "	47	5	1/4	RC07GF470J
R14	" "	330	5	1/4	RC07GF331J
R15	" "	220	5	1/4	RC07GF221J
R16	" "	680	5	1/4	RC07GF681J
R17	" "	68	5	1/4	RC07GF680J
R18	" "	1.5K	5	1/4	RC07GF152J
R19	" "	8.2K	5	1/4	RC07GF822J
R20	" "	5.6K	5	1/4	RC07GF562J
R21	" "	10K	5	1/4	RC07GF103J
R22	" "	4.7K	5	1/4	RC07GF472J
R23	" "	47	5	1/4	RC07GF470J
R24	" "	330	5	1/4	RC07GF331J
R25	" "	220	5	1/4	RC07GF221J
R26	" "	680	5	1/4	RC07GF681J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Variable, modified				RCI B-02915-1
C2	Ceramic, Tubular	6.8pf	.25pf		Erie 301-U2J-689C,TCN75(
C3	Trimmer, Piston	8-13pf			JFD NVC26G
C4	Ceramic, Disc	.047uf	20	25	Sprague Monolythic 3C15
C5	Mica	180pf	2	500	CD7F181G500
C6	Same as C4				
C7	Ceramic, Feedthru	1000pf	20		CTC 3835-37-2
C8	Mica, Fixed	1500pf	5	500	CM06F152JN3
C9	Same as C4				
C10	Mica	470pf	2	100	CD7F471G100
C11	Same as C4				
C12	Ceramic	3300pf	20	200	Erie 4825X5V332M

CAPACITORS - Cont'd. 400 Series

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C13	Same as C2				
C14	Polystyrene	47pf	1	500	CD6C47G500
C15	Ceramic	1000pf	20	200	Erie 4815X5V102M
C16	Same as C12				
C17	Same as C15				
C18	Same as C5				
C19	Same as C10				
C20	Same as C4				
C21	Same as C12				
C22	Same as C2				
C23	Same as C14				
C24	Same as C15				
C25	Same as C15				
C26	Same as C12				

INDUCTOR

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
L1	Coil Assembly, Variable	RCI D-02968

TRANSISTORS

Q1	PNP, 2N2996	2N2996
Q2	Same as Q1	
Q3	Same as Q1	
Q4	Same as Q1	
Q5	Same as Q1	

CONNECTORS

W1	Coaxial Cable Assy.	RCI D-01974-5
W2	Coaxial Cable Assy.	RCI D-01974-6
P1	Connector, Part of W1	
P2	Connector, Part of W2	

RA6217 2nd MIXER - 500 Series - Dwg. G-01301

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R501	Fixed Composition	27K	5	1/4	RC07GF273J
R502	" "	4.7K	5	1/4	RC07GF472J
R503	" "	680	5	1/4	RC07GF681J
R504	" "	12K	5	1/4	RC07GF123J
R505	" "	2.2K	5	1/4	RC07GF222J
R506	" "	8.2K	5	1/4	RC07GF822J
R507	" "	4.7K	5	1/4	RC07GF472J
R508	" "	3.9K	5	1/4	RC07GF392J
R509	" "	10K	5	1/4	RC07GF103J
R510	" "	470	5	1/4	RC07GF471J
R511	" "	270	5	1/4	RC07GF271J
R512	" "	56	5	1/4	RC07GF560J
R513	" "	100	5	1/4	RC07GF101J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C501	Ceramic Disc	.001uf	20	1000	Centralab DD102G
C502	Ceramic	0.1uf	+80 -20	25	Sprague Monolythic 5C7
C503	Ceramic	0.1uf	+80 -20	25	Sprague Monolythic 5C7
C504	Not Assigned				
C505	Same as C502				
C506	Same as C502				
C507	Not Assigned				
C508	Not Assigned				
C509	Same as C501				
C510	Same as C502				
C511	Same as C502				
C512	Same as C502				
C513	Not Assigned				
C514	Mica	150pf	20	500	Centralab CPR-150J
C515	Mica	27pf	20	500	Centralab CPR-27J
C516	Mica	47pf	20	500	Centralab CPR-47J
C517	Mica	100pf	20	500	Centralab CPR-100J
C518	Mica	15pf	5	500	CD10C150J
C519	Mica	56pf	1	500	CD6C560G500
C520	Same as C501				
C521	Same as C514				
C522	Same as C514				
C523	Same as C515				
C524	Same as C514				

INDUCTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
A501	Coil Assembly	RCI D-02981
A502	Coil Assembly	RCI D-02975
A503	Coil Assembly	RCI D-02976
A504	Coil Assembly	RCI D-02977
A505	Coil Assembly	RCI D-02830
A506	Coil Assembly	RCI D-02978
A507	Coil Assembly	RCI D-02979
A508	Coil Assembly	RCI D-02980

TRANSISTORS

Q501	Germanium, PNP, 2N3323	
Q502	Germanium, PNP, 2N3323	
Q503	Germanium, PNP, 2N2996	

CONNECTOR

P501	Coaxial	Cannon DBMF-9W4P-326

RA6217 1 MC MODULE & CAL - 600 Series - Dwg. G-03412

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R601	Fixed Composition	22K	5	1/4	RC07GF223J
R602	" "	6.8K	5	1/4	RC07GF682J
R603	" "	1K	5	1/4	RC07GF102J
R604	" "	820	5	1/4	RC07GF821J
R605	" "	100	5	1/4	RC07GF101J
R606	" "	1K	5	1/4	RC07GF102J
R607	" "	22K	5	1/4	RC07GF223J
R608	" "	6.8K	5	1/4	RC07GF682J
R609	" "	100	5	1/4	RC07GF101J
R610	" "	560	5	1/4	RC07GF561J
R611	" "	33	5	1/4	RC07GF330J
R612	" "	1K	5	1/4	RC07GF102J
R613	" "	18K	5	1/4	RC07GF183J
R614	" "	5.6K	5	1/4	RC07GF562J
R615	" "	1.8K	5	1/4	RC07GF182J
R616	Not Assigned				
R617	Fixed Composition	910	5	1/4	RC07GF911J
R618	" "	39K	5	1/4	RC07GF393J
R619	" "	10K	5	1/4	RC07GF103J
R620	" "	10K	5	1/4	RC07GF103J
R621	" "	100	5	1/4	RC07GF101J
R622	" "	6.8K	5	1/4	RC07GF682J
R623	" "	2.2K	5	1/4	RC07GF222J
R624	" "	1.2K	5	1/4	RC07GF122J
R625	" "	27K	5	1/4	RC07GF273J
R626	" "	4.7K	5	1/4	RC07GF472J
R627	" "	180	5	1/4	RC07GF181J
R628	" "	150	5	1/4	RC07GF151J
R629	" "	2.2K	5	1/4	RC07FG222J
R630	" "	150K	5	1/4	RC07GF154J
R631	" "	39K	5	1/4	RC07GF393J
R632	" "	10K	5	1/4	RC07GF103J
R633	" "	39K	5	1/4	RC07GF393J
R634	" "	39	5	1/4	RC07GF390J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C601	Ceramic Disc	1000pf	20	1000	Centralab DD102G
C602	Ceramic Disc	0.1uf	20	25	Sprague Monolythic 5 C7
C603	Ceramic Disc	0.1uf	20	25	Sprague Monolythic 5 C7

CAPACITORS- Continued

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C604 to C607	Same as C601				
C608	Same as C602				
C609	Ceramic Disc	1000pf	20	200	Erie 8121-026-X5RO102K
C610	Ceramic Disc	3300pf	20	50	Erie 8131-026-X5U0-332M
C611	Not Assigned				
C612 to C615	Same as C602				
C616	Mica	220pf	2	300	CD7F221G300
C617	Mica	470pf	2	100	CD7F471G100
C618	Same as C609				
C619	Not used				
C620	Variable	7-35pf			7S Triko T.C. N-1500
C621	Mica	22pf	1	500	CD6C220500
C622	Ceramic Disc	2.2uf	10	20	TI-SCM225FD020CZ
C623	Mica	0.1uf	20	25	Sprague 5C7
C624	Mica, Fixed	1000pf 20	20	1000	CM06F102JN3
C625	Same as C602				
C626	Not used				
C627	Not used				
C628	Same as C602				
C629	Not used				

INDUCTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
A601	Coil Assembly	RCI D-02064
A602	Coil Assembly	RCI D-02982
A603	Coil Assembly	RCI D-02829
A604	Coil Assembly	RCI D-02983

DIODES

CR601		1N4836

TRANSISTORS

Q601, 602, 604	2N3323	RCI 30251
Q603	2N1396	Amperex 2N1396
ML1	Decade counter (mircrologic)	Fairchil U5B995 879X

CRYSTAL

Y601	1 mc crystal, CR-18/U	RCI B-03028
XY601	Crystal socked (2 req'd.) - Amp #380598-1	RCI 70850

CONNECTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
	Connector	Cannon DBMF-9W4P-326
J1A1	Connector, Right Angle	Cannon DM53743-5000
J1A2	Connector, Right Angle	Cannon DM53743-5000
J1A3	" " "	"
J1A4	" " "	"

A6217 37.5 MC GENERATOR - 700 Series - Dwg. G-1303

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R701	Fixed Composition	56	5	1/4	RC07GF560J
R702	" "	1.8K	5	1/4	RC07GF182J
R703	" "	820	5	1/4	RC07GF821J
R704	" "	390	5	1/4	RC07GF391J
R705	" "	270	5	1/4	RC07GF271J
R706	" "	22	5	1/4	RC07GF220J
R707	Fixed Composition	15K	5	1/4	RC07GF153J
R708	" "	4.7K	5	1/4	RC07GF472J
R709	Potentiometer	5K	20	1/2	Beckman, Helitrim 62PR5K
R710	Fixed Composition	120	5	1/4	RC07GF121J
R711	Same as R702				
R712	Same as R708				
R713	Same as R707				
R714	Same as R710				
R715	Same as R703				
R716	Fixed Composition	47K	5	1/4	RC07GF473J
R717	Same as R708				
R718	Not Assigned				
R719	Fixed Composition	680	5	1/4	RC07GF681J
R720	" "	12K	5	1/4	RC07GF123J
R721	" "	8.3K	5	1/4	RC07GF822J
R722	" "	1.2K	5	1/4	RC07GF122J
R723	Same as R704				
R724	Same as R702				
R725	Fixed Composition	150	5	1/4	RC07GF151J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C701	Ceramic Disc	0.1uf	20	25	Sprague Monolythic 5C7
C702	Same as C701				

CAPACITORS - Continued

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C703	Same as C701				
C704	Same as C701				
C705	Same as C701				
C706	Not Assigned				
C707	Mica	22pf	1	500	CD6C220J500
C708	Variable	4.5-20pf			7S Triko T.C.N-750
C709	Mica	27pf	1	500	CD6C270J500
C710	Variable	7-35pf			7S Triko T.C.N-1500
C711	Same as C709				
C712	Not Assigned				
C713	Same as C708				
C714	Same as C709				
C715	Same as C710				
C716	Mica	18pf	1	500	CD6C180J500
C717	Same as C701				
C718	Same as C701				
C719	Ceramic	3300pf	20	100	Erie 8131-026X50332M
C720	Same as C719				
C721	Same as C719				
C722	Same as C719				
C723	Not Assigned				
C724	Not Assigned				
C725	Same as C701				
C726	Same as C701				
C727	Ceramic, Disc	.047uf	20	25	Sprague Monolythic 3C15
C728	Same as C708				
C729	Mica	100pf	1	300	CD6F101G300
C730	Same as C701				
C731	Same as C701				
C732	Mica	68pf	1	500	CD6C80G500
C733	CD-GP	1000pf	20	1000	CD60-AW-102M
C734	Same as C732				

DIODE

CR1	Germanium, Sub-miniature	

INDUCTORS

A701	Assembly	RCI D-02957
A702	Assembly	RCI D-03031
L701	Coil Assembly	RCI D-02956
L702	Coil Assembly	RCI D-02955
L703	Coil Assembly, Same as L1	
L704	Coil Assembly, Same as L2	

TRANSISTORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
Q701	PNP 2N2996				
Q702	Same as Q701				
Q703	PNP 2N3323				
Q704	Same as Q703				
Q705	Same as Q701				

RA6217 37.5 MC FILTER - 800 Series - Dwg. G-01305

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C801	Polystyrene	56pf	2.5	125	Diel, RCI 26810
C802	Same as C801				
C803	Same as C801				
C804	Same as C801				
C805	Same as C801				
C806	Same as C801				
C807	Polystryene	56pf	2.5	125	RCI 26810
C808	Polystryene	560pf	5	33	RCI 26822

INDUCTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
L801	Coil Assembly, Variable	RCI D-02972
L802	Coil Assembly, Variable	RCI D-02971
L803	Same as L802	
L804	Same as L802	
L805	Same as L802	
L806	Same as L802	
L807	Same as L802	

RA.6217 3rd MIXER - 900 Series - Dwg. G-01302

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfgr. Part No. or Mil Type Designation
R1	Fixed Composition	330	5	1/4	RC07GF331J
R2	Fixed Composition	1K	5	1/4	RC07GF102J
R3	Fixed Composition	18K	5	1/4	RC07GF183J
R4	Fixed Composition	10	5	1/4	RC07GF100J
R5	Fixed Composition	1K	5	1/4	RC07GF102J
R6	Fixed Composition	3.9K	5	1/4	RC07GF392J
R7	Fixed Composition	82	5	1/4	RC07GF820J
R8	Not Assigned				
R9	Fixed Composition	680	5	1/4	RC07GF681J
R10	Fixed Composition	1.5K	5	1/4	RC07GF152J
R11	Not Assigned				
R12	Fixed Composition	3.9K	5	1/4	RC07GF392J
R13	Fixed Composition	2.2K	5	1/4	RC07GF222J
R14	Not Assigned				
R15	Fixed Composition	82K	5	1/4	RC07GF823J
R16	Fixed Composition	18K	5	1/4	RC07GF183J
R17	Fixed Composition	39	5	1/4	RC07GF390J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfgr. Part No. or Mil Type Designation
C1	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C2	Ceramic	3300pf	20	50	Erie 8131-026X5U0332M
C3	Same as C1				
C4	Same as C2				
C5	Fixed Mica	150pf	2	500	CD7F151G500
C6	Fixed Mica	180pf	2	500	CD7F181G500
C7	Fixed Mica	39pf	1pf	500	CD6C390G500
C8	Same as C2				
C9	Same as C6				
C10	Fixed Mica	68pf	1	500	CD6C680G500
C11	Same as C5				
C12	Same as C1				
C13	Same as C1				
C14	Same as C2				
C15	Same as C2				
C16	Fixed Mica	820pf	2	100	CD7F821G100
C17	Same as C16				
C18	Ceramic	.01uf	20	25	Sprague 3C3

RA.6217 3rd MIXER - 900 Series - Dwg. G-01302

INDUCTORS

Ckt. Ref.	Description	Mfgr. Part No. or Mil Type Designation
L1	Coil Assembly, Variable	RCI D-02965
L2	Coil Assembly, Variable	RCI D-02967
L3	Coil Assembly, Variable	RCI D-02966
L4	Coil Assembly, Variable	RCI D-02969
L5	Coil Assembly, Variable	RCI D-02136
L6	Coil Assembly, Variable	RCI D-02136
L7	Not Assigned	
L8	Coil Assembly, Variable	RCI D-02970

TRANSFORMERS

Ckt. Ref.	Description	Mfgr. Part No. or Mil Type Designation
T1	Transformer Assembly	RCI D-02265
A1	Diodes and Transformer Assembly, Potted	RCI C-02274

TRANSISTORS

Q1	2N2996
Q2	2N2368
Q3	2N2368

DIODE

CR1	Diode - IN483B

CONNECTORS

P1	Connector	Cannon DBMF-9W4P-326
P1A1	Coax., Straight	Cannon DM53742-5006
P1A2	Same as P1A1	
P1A3	Same as P1A1	
P1A4	Same as P1A1	

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	100	5	1/4	RC07GF101J
R2	" "	390	5	1/4	RC07GF391J
R3	" "	2.2K	5	1/4	RC07GF222J
R4	" "	22K	5	1/4	RC07GF223J
R5	Same as R2				
R6	Fixed Composition	270	5	1/4	RC07GF271J
R7	Same as R2				
R8	Fixed Composition	150	5	1/4	RC07GF151J
R9	" "	150K	5	1/4	RC07GF154J
R10	" "	1.8K	5	1/4	RC07GF182J
R11	" "	330	5	1/4	RC07GF331J
R12	" "	1.8K	5	1/4	RC07GF182J
R13	" "	150K	5	1/4	RC07GF154J
R14	" "	75	5	1/4	RC07GF750J
R15	" "	6.8K	5	1/4	RC07GF682J
R16	" "	68	5	1/4	RC07GF680J
R17	" "	1K	5	1/4	RC07GF102J
R18	" "	1.5K	5	1/4	RC07GF152J
R19	Not Assigned				
R20	Fixed Composition	82	5	1/4	RC07GF820J
R21	" "	56	5	1/4	RC07GF560J
R22	" "	10K	5	1/4	RC07GF103J
R23	" "	27K	5	1/4	RC07GF273J
R24	" "	220	5	1/4	RC07GF221J
R25	" "	22	5	1/4	RC07GF220J
R26	" "	1K	5	1/4	RC07GF102J
R27	" "	4.7K	5	1/4	RC07GF472J
R28	" "	27K	5	1/4	RC07GF273J
R29	" "	100	5	1/4	RC07GF101J
R30	" "	75	5	1/4	RC07GF750J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Ceramic, Disc	.01uf	20	25	Sprague Monolythic 3C3
C2	Ceramic, Disc	.01uf	20	25	Sprague Monolythic 3C3
C3	Trimmer, Variable, Mod.				RCI B-02915-2
C4	Piston, Variable	0.8-13pf			JFD NVC26G
C5	Mica	56pf	5	500	CM05E560JN3
C6	Ceramic, Tubular	18pf	5		Erie 315-U2J-180J, TCN-750
C7	Ceramic, Disc	.047uf	20	25	Sprague Monolythic 3C15
C8	Tantalum	1.0uf	10	35	Kemet K1J35KS
C9	Same as C8				
C10	Same as C7				
C11	Same as C1				
C12	Same as C1				
C13	Same as C7				
C14	Same as C1				

CAPACITORS - Cont'd.

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C15	Same as C1				
C16	Same as C7				
C17	Same as C1				
C18	Ceramic Disc	.1uf	20	25	Sprague 5C7 Monolythic

TRANSISTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
Q1	Silicon, NPN - 2N918, Lo Power, 480 MHz	
Q2	Same as Q1	
Q3	Same as Q1	
Q4	Same as Q1	

DIODES

CR1	Silicon 1N626, Switching	
CR2	Same as CR1	
VR1	Zener 1N711A	
VR2	Same as VR1	
VR3	Zener 1N709A	
VR4	Same as VR3	
VR5	Zener 1N710A	

TRANSFORMER

T1		RCI D-02914

COIL ASSEMBLY

L1		RCI D-02913

CONNECTORS

J1001	Plug	Cannon DBM-9W4P-326
J1001-A1 -A2 -A3	Coax connector	Cannon DM53742-5006

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1201	Fixed Composition	330	5	1/4	RC07GF331J
R1202	" "	1K	5	1/4	RC07GF102J
R1203	" "	3.9K	5	1/4	RC07GF392J
R1204	" "	18K	5	1/4	RC07GF183J
R1205	" "	56	5	1/4	RC07GF560J
R1206	" "	820	5	1/4	RC07GF821J
R1207	" "	10K	5	1/4	RC07GF103J
R1208	Same as R1207				
R1209	Fixed Composition	33	5	1/4	RC07GF330J
R1210	" "	1K	5	1/4	RC07GF102J
R1211	Same as R1210				
R1212	Same as R1210				
R1213	Fixed Composition	3.9K	5	1/4	RC07GF392J
R1214	" "	18K	5	1/4	RC07GF183J
R1215	" "	1K	5	1/4	RC07GF102J
R1216	" "	1.5K	5	1/4	RC07GF152J
R1217	" "	12K	5	1/4	RC07GF123J
R1218	" "	2.2K	5	1/4	RC07GF222J
R1219	" "	270	5	1/4	RC07GF271J
R1220	Not Assigned				
R1221	Fixed Composition	1K	5	1/4	RC07GF102J
R1222	Same as R1221				
R1223	Fixed Composition	270	5	1/4	RC07GF271J
R1224	" "	680	5	1/4	RC07GF681J
R1225	" "	3.3K	5	1/4	RC07GF332J
R1226	" "	22K	5	1/4	RC07GF223J
R1227	" "	2.7K	5	1/4	RC07GF272J
R1228	" "	4.7K	5	1/4	RC07GF472J
R1229	" "	1K	5	1/4	RC07GF102J
R1230	Not Assigned				
R1231	Fixed Composition	22K	5	1/4	RC07GF223J
R1232	" "	100	5	1/4	RC07GF101J
R1233	" "	390	5	1/4	RC07GF391J
R1234	" "	4.7K	5	1/4	RC07GF472J
R1235	" "	68K	5	1/4	RC07GF683J
R1236	" "	12K	5	1/4	RC07GF123J
R1237	" "	12K	5	1/4	RC07GF123J
R1238	" "	68K	5	1/4	RC07GF683J
R1239	" "	390	5	1/4	RC07GF391J
R1240	" "	4.7K	5	1/4	RC07GF472J
R1241	" "	22K	5	1/4	RC07GF223J
R1242	" "	1K	5	1/4	RC07GF102J
R1243	" "	100	5	1/4	RC07GF101J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1201	Ceramic	0.1uf	20	25	Sprague 5C7A
C1202	Ceramic, Disc	.001uf	10	500	Centralab CE102
C1203	Ceramic	0.1uf	20	25	Sprague 5C7A
C1204	Ceramic	.01uf	+80 -20	25	Erie 5835Y5U103Z
C1205	Tantalum	33uf	10	10	Kemet K33J10KS
C1206	Mica	100pf	10	500	CM05F101JN3
C1207	Not Assigned				
C1208	Ceramic	.01uf	+80 -20	25	Erie 5835Y5U103Z
C1209	Ceramic	0.1uf	20	25	Sprague 5C7A
C1210	Ceramic, Disc	470pf	10	1000	Centralab DD471
C1211	Ceramic, Disc	.001uf		1000	Centralab DD102G
C1212	Ceramic, Disc	0.1uf	20	25	Sprague 5C7A
C1213	Electrolytic	150uf	20	15	Kemet K150J15S
C1214	Ceramic	.01uf	+80 -20	25	Erie 5835Y5U103Z
C1215	Mica	130pf	5	500	CM05F131JN3
C1216	Electrolytic	25uf	+150 -10	25	Sprague TE1207
C1217	Ceramic	.01uf	+80 -20	25	Erie 5835Y5U103Z
C1218	Same as C1217				
C1219	Ceramic, Trimmer	9-35pf			Erie 538-00294R N650
C1220	Ceramic, Tubular	22pf	5		Erie 315-U2J-220J N750
C1221	Mica	130pf	5	500	CM05F131JN3
C1222	Mica	33pf	5	500	CM05C330JN3
C1223	Varicap	57-260pf		100pf - 4V ref.	Eastron VC399
C1224	Same as C1201				
C1225	Same as C1204				
C1226	Same as C1201				
C1227	Mica	15pf	5	500	CM05F150JN3
C1228	Same as C1219				
C1229	Mica	220pf	5	500	CM05F221JN3
C1230	Not Assigned				
C1231	Ceramic, Disc	.001uf	10	500	Centralab CE102
C1232	Same as C1229				
C1233	Same as C1219				
C1234	Same as C1227				
C1235	Same as C1201				
C1236	Same as C1204				

INDUCTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
L1201	Coil Assembly	RCI D-02573
L1202	Coil Assembly	RCI D-02944
A1201	Coil Assembly	RCI D02042
A1202	Coil Assembly	RCI D02043

DIODE

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
CR1201	Germanium 1N281	

TRANSISTORS

Q1201	Germanium - PNP 2N3323	
Q1202	Germanium - PNP 2N2996	
Q1203	Same as Q1201	
Q1204	Same as Q1201	
Q1205	Same as Q1201	
Q1206	Same as Q1201	
Q1207	Same as Q1201	

CRYSTALS

Y1201	1.5985 mc, CR18/U	RCI B-02040
Y1202	1.6015 mc, CR18/U	RCI B-02041

RA6217 POWER SUPPLY, 1300 Series, Dwg. G-01311

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	100K	5	1/4	RC07GF104J
R2	" "	10	5	2W	RC42GF100J
R3	" "	18K	5	1W	RC32GF183J
R4	" "	68	5	1/4	RC07GF680J
R5	Not Assigned				
R6	Fixed Composition	2.7K	5	1/4	RC07GF272J
R7	Potentiometer	1K			Bourns 306 7P-1-102
R8	Fixed Composition	2.2K	5	1/4	RC07GF222J
R9	" "	330	5	1/4	RC07GF331J
R10	" "	1.2K	5	1/4	RC07GF122J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Ceramic, Disc	.02uf	+80 -20	600	Sprague 5HK-S20
C2	Same as C1				
C3	Electrolytic	500uf	+75 -10	50	Sprague 39D507G050GL4
C4	Same as C3				
C5	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C6	Same as C5				
C7	Electrolytic	100uf		25	Sprague TE1211

TRANSFORMER

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
T1	Power Transformer	RCI D-01650

DIODES

CR1A,B,C,D	Diode Bridge	Motorola MDA-920-2
CR2	1N916	
CR3	1N916	
CR4	1N626	
CR5A,B,C,D	Same as CR1	
VR1	1N753A	
VR2	1N2982B or 1N2982RB	

FUSES

F1301	0.5 amp 3AG Slo Blow	RCI 40011
F1302	1.0 amp 3AG Slo Blow	RCI 40012

SWITCH

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
S1	DPDT Slide Switch	Oak #278

TRANSISTORS

Q1	2N3242
Q2	2N1189
Q3	2N2412
Q4	2N3614

CONNECTORS

W1	Power Cord, with plug	Belden 17408-S
P1	Connector, 15 contacts, floating, Female	Cannon DAMF-15-S
P2	Plug, Integral part of W1	

RA6217 AGC - 1400 Series - Dwg. G-1500

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1401	Fixed Composition	15K	5	1/4	RC07GF153J
R1402	" "	3.9K	5	1/4	RC07GF392J
R1403	Potentiometer	500		1/2	Beckman 62P-R500
R1404	Fixed Composition	1K	5	1/4	RC07GF102J
R1405	" "	330	5	1/4	RC07GF331J
R1406	" "	18K	5	1/4	RC07GF183J
R1407	" "	12K	5	1/4	RC07GF123J
R1408	" "	1K	5	1/4	RC07GF102J
R1409	Not Assigned				
R1410	Fixed Composition	180K	5	1/4	RC07GF184J
R1411	" "	120K	5	1/4	RC07GF124J
R1412	" "	10K	5	1/4	RC07GF103J
R1413	" "	10K	5	1/4	RC07GF103J
R1414	" "	680K	5	1/4	RC07GF684J
R1415	Potentiometer	1M	30	1/2	Beckman 62P-R1Meg.
R1416	Fixed Composition	6.8K	5	1/4	RC07GF682J
R1417	" "	120K	5	1/4	RC07GF124J
R1418	" "	1K	5	1/4	RC07GF102J
R1419	" "	2.2K	5	1/4	RC07GF222J
R1420	" "	6.8K	5	1/4	RC07GF682J
R1421	" "	15K	5	1/4	RC07GF153J
R1422	" "	1330	1	1/8	IRC-MEA(T-O)
R1423	" "	3.3K	5	1/4	RC07GF332J
RT1401	Thermistor	100K			Victory Eng'r. 51A2

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1401	Tantalum	2.2uf	10	10	T.I. SCM225FP020-A2
C1402	Mica	180pf	5	500	CM05F181JN3
C1403	Mica	8200pf	5	500	CM07F822JN3
C1404	Mica	1500pf	5	500	CM06F152JN3
C1405	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C1406	Mica	330pf	5	500	CM05F331JN3
C1407	Same as C1405				
C1408	Same as C1405				
C1409	Not Assigned				
C1410	Same as C1405				
C1411	Same as C1405				
C1412	Tantalum	.22uf	10	35	T.I. SCM24-224FP035
C1413	Tantalum	10uf	10	20	T.I. SCM106BP020A2

DIODES

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
CR1401	Diode 1N659	RCI 35509
CR1402	Diode 1N483B	RCI 35512
CR1403	Same as CR1402	

TRANSISTORS

Q1401	2N2996
Q1402	2N708
Q1403	2N3242
Q1404	Same as Q1403
Q1405	2N1309
Q1406	2N1102

TUNED CIRCUITS

A1401	Circuit Assembly	RCI D-02037
A1402	Circuit Assembly	RCI D-02038

RA 6217 AUDIO BOARD - 1500 Series - Dwg. G-1499

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1500	Fixed Composition	5.6K	5	1/4	RC07GF562J
R1501	" "	2.2K	5	1/4	RC07GF222J
R1502	Same as R1501				
R1503	Fixed Composition	5.6K	5	1/4	RC07GF562J
R1504	" "	330	5	1/4	RC07GF331J
R1505	" "	5.6K	5	1/4	RC07GF562J
R1506	" "	22K	5	1/4	RC07GF223J
R1507	" "	15K	5	1/4	RC07GF153J
R1508	" "	150K	5	1/4	RC07GF154J
R1509	" "	470	5	1/4	RC07GF471J
R1510	Same as R1509				
R1511	Fixed Composition	150K	5	1/4	RC07GF154J
R1512	" "	1K	5	1/4	RC07GF102J
R1513	" "	150K	5	1/4	RC07GF154J
R1514	" "	22K	5	1/4	RC07GF223J
R1515	" "	68K	5	1/4	RC07GF683J
R1516	" "	68	5	1/4	RC07GF680J
R1517	" "	2.2K	5	1/4	RC07GF222J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1500	Electrolytic	100uf	+100 -20	15	Sprague TE1162
C1501	Ceramic, Disc	0.1uf	20	25	Sprague 5C7A
C1502	Electrolytic	2uf	+100 -20	12	Sprague TE1121
C1503	Same as C1500				
C1504	Tantalum	2.2uf	20	10	Kemet K2R2J20K
C1505	Not Assigned				
C1506	Same as C1500				
C1507	Same as C1500				
C1508	Electrolytic	100uf	+100 -20	15	Sprague TE1162
C1509	Ceramic, Disc	1000pf	20	1000	CRL-DD102G
C1510	Electrolytic	20uf	20	6	Sprague TE1090
C1511	Ceramic, Disc	.33uf		35	Kemet KR33J35KS
C1512	Electrolytic	50uf		25	Sprague TE1209

TRANSFORMERS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
T1500	Audio	RCI D-02096

TRANSFORMERS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
T1501	Audio Output	RCI D-02908
T1502	Audio Output	RCI D-02907

TRANSISTORS

Q1500	2N2613
Q1501	2N3392
Q1502	Same as Q1501
Q1503	Same as Q1501

RA6217 IF ASSEMBLY #1 - 1600 Series - Dwg. G-01505

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1601	Fixed Composition	100	5	1/4	RC07GF101J
R1602	" "	100	5	1/4	RC07GF101J
R1603	" "	18K	5	1/4	RC07GF183J
R1604	" "	4.7K	5	1/4	RC07GF472J
R1605	" "	3.9K	5	1/4	RC07GF392J
R1606	" "	470	5	1/4	RC07GF471J
R1607	" "	1K	5	1/4	RC07GF102J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1601	Ceramic, Disc	0.1uf	20	25	Sprague 5C7
C1602	Same as C1601				
C1603	Same as C1601				
C1604	Not Assigned				
C1605	Same as C1601				

DIODE

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
CR1601	Germanium, Sub-miniature	1N281

INDUCTOR

A1601	Coil Assembly	RCI D-02984

TRANSISTOR

Q1601	PNP, Germanium-2N2996	2N2996

CONNECTORS

W1	Cable Assembly	RCI D-01974-4
J1	Jack, Part of W1	

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	150	5	1/4	RC07GF151J
R2	" "	2.2K	5	1/4	RC07GF222J
R3	" "	18K	5	1/4	RC07GF183J
R4	" "	3.9K	5	1/4	RC07GF392J
R5	" "	330	5	1/4	RC07GF331J
R6	" "	47	5	1/4	RC07GF470J
R7	" "	1K	5	1/4	RC07GF102J
R8	" "	22K	5	1/4	RC07GF223J
R9	" "	4.7K	5	1/4	RC07GF472J
R10	Same as R9				
R11	Fixed Composition	5.6K	5	1/4	RC07GF562J
R12	" "	3.9K	5	1/4	RC07GF392J
R13	" "	10K	5	1/4	RC07GF103J
R14	" "	8.2K	5	1/4	RC07GF822J
R15	" "	220	5	1/4	RC07GF221J
R16	" "	3.9K	5	1/4	RC07GF392J
R17	" "	12K	5	1/4	RC07GF123J
R18	" "	330	5	1/4	RC07GF331J
R19	Potentiometer	2K	20	1/2	Beckman 61P-R2K
R20	Same as R7				

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Ceramic, Disc	0.1uf	20	25	Sprague Monolythic 5C7
C2	Same as C1				
C3	Ceramic, Disc	.047uf	20	25	Sprague Monolythic 3C15
C4	Electrolytic	10uf	+100 -20	25	Sprague TE-1204
C5	Same as C1				
C6	Same as C3				
C7	Same as C1				
C8	Same as C1				
C9	Same as C1				
C10	Same as C3				
C11	Same as C1				
C12	Electrolytic	50uf	+100 -20	25	Sprague TE-1309
C13	Same as C3				
C14	Same as C3				

TUNED CIRCUITS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
A1	Circuit Assembly	RCI D-02933

TUNED CIRCUITS

Mkt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
A2	Circuit Assembly	RCI D-02937
A3	Circuit Assembly	RCI D-02938

DIODE

CR1	Silicon 1N626 (Switching)	

TRANSISTORS

Q1	PNP-Germanium 2N3323, High Frequency	
Q2	PNP- Silicon 2N2412, Low Power	
Q3	Same as Q1	
Q4	Same as Q1	

RA6217 455KHz CONVERTER - 1280 Series - Dwg. G-1502

RESISTORS

Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1801	Fixed Composition	100	5	1/4	RC07GF101J
R1802	" "	68K	5	1/4	RC07GF683J
R1803	" "	390	5	1/4	RC07GF391J
R1804	" "	4.7K	5	1/4	RC07GF472J
R1805	" "	6.8K	5	1/4	RC07GF682J
R1806	" "	22K	5	1/4	RC07GF223J
R1807	" "	1K	5	1/4	RC07GF102J
R1808	" "	1.8K.	5	1/4	RC07GF182J
R1809	" "	100	5	1/4	RC07GF101J
R1810	" "	270	5	1/4	RC07GF271J
R1811	" "	1K	5	1/4	RC07GF102J
R1812	" "	100	5	1/4	RC07GF101J
R1813	" "	3.3K	5	1/4	RC07GF332J
R1814	" "	18K	5	1/4	RC07GF183J
R1815	" "	1K	5	1/4	RC07GF102J
R1816	" "	10	5	1/4	RC07GF100J
R1817	Not Used				
R1818	" "	100	5	1/4	RC07GF101J
R1819	" "	330	5	1/4	RC07GF331J
R1820	" "	1.2K	5	1/4	RC07GF122J
R1821	" "	15K	5	1/4	RC07GF153J
R1822	" "	120	5	1/4	RC07GF121J

CAPACITORS

C1801	Electrolytic	.56uf	10	35	T.I. SCM564FPO35A2
C1802	Ceramic	0.1uf	20		Sprague 5C7
C1803	Not Assigned				
C1804	Mica	150pf	5	500	CM05C151JN3
C1805	Ceramic, Disc	1000pf	10	500	Centralab CE-102
C1806	Variable	7-35pf			7S-TRIKO N-1500
C1807	Not Assigned				
C1808	Ceramic, Disc	470pf	10	500	Centralab CE471
C1809	Same as C1802				
C1810	Same as C1802				
C1811	Same as C1802				
C1812	Same as C1802				
C1813	Same as C1801				
C1814	Not Used				
C1815	Mica	18uf	5		CM05C180JN3
C1816	Not Used				
C1817	Tantalum	2.2uf	5	20	Kemet K2R2J20KS
C1818	Ceramic	.01uf	80-20		Erie 5835Y5U-103Z

RA. 6217 455KHz CONVERTER (Continued)

INDUCTORS

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
A1801	Coil Assembly	RCI D-03328
A1802	Coil Assembly	RCI D-03329
A1803	Coil Assembly	RCI D-03330

TRANSISTORS

Q1801	2N3323	
Q1802	2N3242	
Q1803	Same as Q1802	
Q1804	Same as Q1802	
Q1805	Same as Q1802	

CRYSTAL

Y1801	1.145 mc- CR18/U	RCI 37006

NOTE:

Receivers with the 100KHz IF OUTPUT CONVERTER have the following parts changed:

R1818	Fixed Composition	910	5	1/4	RC07GF911J
R1819	Same as R1801				
C1815	Dipped Mica	100uf	5	350	CM05F101JN3
A1801	Coil Assembly				D04023
A1802	Coil Assembly				D04023
A1803	Coil Assembly				D04025

CRYSTAL

Y1801	Crystal, 1.5 MHz, CR18/U McCoy

RA6217 EMITTER FOLLOWER - 1000 Series - Dwg. G-01736

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1901	Fixed Composition	100K	5	1/4	RC07GF104J
R1902	" "	10K	5	1/4	RC07GF103J
R1903	" "	22K	5	1/4	RC07GF223J
R1904	" "	5.6K	5	1/4	RC07GF562J
R1905	Pot. (Helitrim)	50K	20	1/2	Beckman 61PR50K
R1906	Fixed Composition	180	5	1/4	RC07GF181J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1901	Ceramic, Disc	0.1uf	20	25	Sprague 5C7
C1902	Electrolytic	10uf	+100 -20	25	Sprague TE-1204
C1903	Electrolytic	50uf	+100 -20	25	Sprague TE-1209

TRANSISTOR

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
Q1901	2N3242, Silicon, Low Frequency	

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	68K	5	1/4	RC07GF683J
R2	" "	10K	5	1/4	RC07GF103J
R3	" "	6.2K	5	1/4	RC07GF622J
R4	" "	1K	5	1/4	RC07GF102J
R5	" "	27K	5	1/4	RC07GF273J
R6	" "	4.7K	5	1/4	RC07GF472J
R7	" "	1K	5	1/4	RC07GF102J
R8	" "	200	5	1/4	RC07GF201J
R9	" "	1K	5	1/4	RC07GF102J
R10	" "	22K	5	1/4	RC07GF223J
R11	" "	1K	5	1/4	RC07GF102J
R12	" "	15K	5	1/4	RC07GF153J
R13	Potentiometer	10K	20	1/4	Beckman 62P-R10K
R14	Same as R2				
R15	Same as R4				
R16	Fixed Composition	510	5	1/4	RC07GF511J
R17	Same as R12				
R18	Same as R6				
R19	Same as R6				
R20	Same as R6				
R21	Not Assigned				
R22	Not Assigned				

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Ceramic, Variable	7-35pf			7S Triko N-1500
C2	Ceramic, Disc	.001uf	10	500	Centralab CE-102
C3	Same as C2				
C4	Ceramic, Disc	.005uf	20	50	Sprague TG-050
C5	Tantalum	2.2uf	10	20	TI #SCM-A2-225FP
C6	Same as C2				
C7	Ceramic	0.1uf	20	25	Sprague Monolythic 5C7
C8	Same as C5				
C9	Same as C7				
C10	Mica	330pf	5	500	CM05F331JN3
C11	Mica	120pf	5	500	CM05F121JN3
C12	Ceramic	.022uf	20	25	Sprague Monolythic 3C9
C13	Mica	2200pf	5	500	CM06F222JN3
C14	Ceramic, Disc	820pf	10	500	Centralab #1D-821
C15	Same as C14				
C16	Ceramic, Disc	750pf	10	500	Centralab 1D-751
C17	Mica	27pf	5	500	CM05E270JN3
C18	Not Assigned				

INDUCTOR

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
L1	Coil Assembly, 150 uh	National B17310

TRANSISTORS

Q1	2N3323	
Q2	2N705	
Q3	TN60	Sprague TN60
Q4	TN62	Sprague TN62

DIODES

CR1	1N914	
CR2	1N914	
VR1	Zener - 1/4M3.9AZ5	Motorola

RA6217 I.F. PACKAGE - 3000 Series - Dwg. G-2028

SUBASSEMBLIES

Ckt. Ref.	Description
A3001	2nd, 3rd & 4th I.F. Amplifier
A3002	Automatic Gain Control (A.G.C.)
A3003	Product Detector
A3004	FM Insertion Oscillator
A3005	FM Demodulator
A3006	455 KHz Converter

CONNECTORS

Ckt. Ref.	Description	Mfgr. Part No. or Mil Type Designation
W3001	Cable Assembly	RCI D-01974-3
J3001	Not Assigned	
J3002	Receptacle, BNC	UG-1094/U
J3003	Receptacle, 1.145 MHz, In-Out	UG-1094/U
J3004	Receptacle, 1.6 MHz, Out	UG-1094/U
J3005	Integral Part of W3001	
P3001	Plug	Cannon DCMF-37P
AT3001	Termination, 75 ohm Resistive	RCI B-03290

RA6217 FM INSERTION OSCILLATOR - 3100 Series - Dwg. G-2030

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	12K	5	1/4	RC07GF123J
R2	" "	68K	5	1/4	RC07GF683J
R3	" "	390	5	1/4	RC07GF391J
R4	" "	4.7K	5	1/4	RC07GF472J
R5	" "	22K	5	1/4	RC07GF223J
R6	" "	1K	5	1/4	RC07GF102J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	
C1	Mica	220pf	5	500	CM05F221JN3
C2	Mica	30pf	5	500	CM05C300JN3
C3	Ceramic	0.1uf	20	25	Sprague 5C7
C4	Tantalum	2.2uf	10	20	Kemet K2R2J20KS

CRYSTAL

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
Y1	1.72 mc	CR 18/U

DIODE

CR1	1N281

TRANSISTOR

Q1	2N3323

RESISTORS:

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfgr. & Part No., or Mil Type Designation
R1	Fixed Composition	220	5	1/4	RC07GF221J
R2	Fixed Composition	47	5	1/4	RC07GF470J
R3	Fixed Composition	100	5	1/4	RC07GF101J
R4	Fixed Composition	56	5	1/4	RC07GF560J
R5	Pot. (BFO Tune)	10K	10	1	CTS Type 90, 3/4 lg. shaft
R6	Fixed Composition	15K	5	1/4	RC07GF153J
R7	Fixed Composition	6.8K	5	1/4	RC07GF682J
R8	Same as R7				
R9	Fixed Composition	4.7K	5	1/4	RC07GF473J
R10	Same as R9				
R11	Fixed Composition, Value Determined by Test, 1/4W				
R12	Fixed Composition	1K	5	1/4	RC07GF102J
R13	Fixed Composition	12K	5	1/4	RC07GF123J
R14	Fixed Composition	22K	5	1/4	RC07GF223J
R15	Fixed Composition	39K	5	1/4	RC07GF393J
R16	Fixed Composition	39K	5	1/4	RC07GF393J
R17	Fixed Composition	8.2K	5	1/4	RC07GF822J
R18	Fixed Composition, Value Determined by Test, 1/4W				
R19A	Pot., Concentric (IF Gain)	500			RCI B-02161
R19B	Pot., Concentric (AF Gain)	10K			RCI B-02161
R20	Pot., (AF Level)	10K	20	1	CTS Type 90, 7/8 lg. shaft

CAPACITORS:

C1	Ceramic, disc	.001uf	10	500V	Centralab CE-102

FILTERS:

FL1	13 KHz Crystal Filter (RA.6217A only)	RCI C-01533
FL2	200 Hz Crystal Filter	RCI C-01512
FL3	1 KHz Crystal Filter	RCI C-01513
FL4	3 KHz Crystal Filter	RCI C-01514
FL5	6 KHz Crystal Filter	RCI C-01515
*FL1	20 KHz Crystal Filter (RA.6217C only)	RCI C-01851

SWITCHES:

S1 (A, B, C&D) IF Bandwidth - KHz	RCI C-01744
S2 (A, B, C) Det - BFO Mode	RCI C-01611

Ckt. Ref.	Description	Mfgr. & Part No. or Mil Type Designation
CONNECTORS:		
P1	Coaxial	Micon 1002
P2	Coaxial	Micon 1002
J1	Female, 37 Contact	Cannon DCMF-37S
W1	Cable, Coaxial	UG-196A/U

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. ±%	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	100K	5	1/4	RC07GF104J
R2	Fixed Composition	5.6	5	1	Sprague TE1209
R3	Fixed Composition	18K	5	1	RC32GF183J
R4	Fixed Composition	68	5	1/4	RC07GF680J
R5	Not Used				
R6	Fixed Composition	2.7K	5	1/4	RC07GF272J
R7	Potentiometer	1K			Bourns 3067P-1-102
R8	Fixed Composition	2.2K	5	1/4	RC07GF222J
R9	Fixed Composition	330	5	1/4	RC07GF331J
R10	Fixed Composition	1.2K	5	1/4	RC07GF122J
R11	Fixed Composition	680	5	1/2	RC20GF681J
R12	Fixed Composition	5.6K	5	1/2	RC20GF562J
R13	Fixed Composition	5.6	5	1	RC32GF5R6J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. ±%	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Ceramic, Disc	.02uf	+80 -20	500	Sprague 5HK-S20
C2	Same as C1				
C3	Electrolytic	500uf	+75 -20	50	Sprague 39D507G050GL4
C4	Electrolytic	50uf		25	Sprague TE1209
C5	Monolythic	0.1uf	20	25	Sprague 5C7
C6	Same as C5				
C7	Electrolytic	100uf		25	Sprague TE1211
C8	Same as C3				

DIODES

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
CR1	Bridge rectifier (A, B, C & D)	Motorola MDA920-2
CR2	1N916	
CR3	1N916	
CR4	1N626	
CR5	Same as CR1	
CR6	1N538	
VR1	Zener 1N753A, 6.2V, 400mw	
VR2	Zener 1N2982RB	

RA.6217 - AC Power Unit/Battery Charger, 100 Series (Continued)

FUSES

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
F1	0.5 Amp Slow Blow 3AG	
F2	1.0 Amp Slow Blow 3AG	
F3	.750 Amp Slow Blow 3AG	

TRANSFORMER

T1	Power	RCI D-1650

TRANSISTORS

Q1	2N3242	
Q2	2N1189	
Q3	2N2412	
Q4	2N3614	
Q5	2N3055	

SWITCHES

S1	DPDT, Slide	Oak 278
S2	Same as S1	

CONNECTORS

P1	15 contacts	Cannon DAMF-15S
J1	15 contacts	Cannon DAM - 15P
W1	Cord, Power	Belden 17408S
P2	Plug, Part of W1	

MA.6301 DC to DC Converter - Series 100 - Dwg. G-02449

RESISTORS

Ckt. Ref.	Description	Value Ohms	Tol. %	Rating Watts	Mfr. Part No. or Mil Type Desig.
R1	Fixed Composition	100K	5	1/4	RC07GF104J
R2	Not Used				
R3	Fixed Composition	18K	5	1/4	RC07GF183J
R4	" "	68	5	1/4	RC07GF680J
R5	Not Used				
R6	Fixed Composition	2.7K	5	1/4	RC07GF272J
R7	Potentiometer	1K		1/5	Bourns 3067P-1-102
R8	Fixed Composition	2.2K	5	1/4	RC07GF22J
R9	" "	330	5	1/4	RC07GF331J
R10	" "	1.2K	5	1/4	RC07GF122J
R11	" "	510	5	1/4	RC07GF511J
R12	" "	15	5	1/2	RC20GF150J
R13	" "	15	5	1/2	RC20GF150J
R14	" "	1	5	1/2	RC20GF100J
R15	" "	1	5	1/2	RC20GF100J

CAPACITORS

Ckt. Ref.	Description	Value	Tol. %	Rating Volts	Mfr. Part No. or Mil Type Desig.
C1	Ceramic Disc	.02uf	80-20	500	Sprague 5HK-S20
C2	Same as C1				
C3	Not Used				
C4	Electrolytic	500uf	75-10	50	Sprague 39D507G050GL4
C5	Ceramic Disc	.1pf	20	25	Sprague 5C7
C6	Same as C5				
C7	Electrolytic	100uf		25	Sprague TE1211
C8	Same as C7				

DIODES

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
CR1	Diode Bridge	Motorola MDA 920-2
CR2	1N916	
CR3	1N916	
CR4	1N626	
CR5	Same as CR1	
CR6	1N4816	
CR7	1N281	
CR8	1N281	
VR1	Zener 1N753A	
VR2	Zener 1N2982RB	

MA.6301 DC to DC Converter - Series 100 - Dwg. G-02449

TRANSFORMER

Ckt. Ref.	Description	Mfr. Part No. or Mil Type Desig.
T1	Power	RCI D-02462

TRANSISTORS

Q1	2N3242
Q2	2N1189
Q3	2N2412
Q4	2N3614
Q5	2N3614
Q6	2N3055
Q7	2N3055

FUSES

F1	2 amp Slow Blow 3 AG
F2	1 amp Slow Blow 3 AG

SWITCH

S1	DPDT Slide Switch	Oak 278

TERMINALS

J1	Binding Post, Red	H.H. Smith #378 RED
J2	Binding Post, White	H.H. Smith #378 BLACK
J3	Thumb Nut, Knurled	Federal 75101
P1	Connector, 15 contacts floating	Cannon DAMF-15-S

MA. 6300 INSTRUCTION SHEET

WARNING

READ THESE INSTRUCTIONS BEFORE USING A.C. POWER UNIT/BATTERY CHARG

It is important that a simple continuity test be made before the A.C. Powe Unit/Battery Charger MA.6300 be plugged into the receiver.

When the receiver is used with an A.C. Power Unit, both sides of the A.C. line are switched at the front panel. When the A.C. Power Unit/Battery Charger is used the -16 V is switched using one of the wires which previously carried the A.C. line. If during assembly at the plant these wires are crossed over, the A.C. line is connected to the D.C. line in the receiver resulting in permanent damage to the receiver and the MA. 6300. This has been checked at the plant but must be rechecke in view of the damage that would result if an error was made. In order to ensure that this does not happen, a simple test must be made.

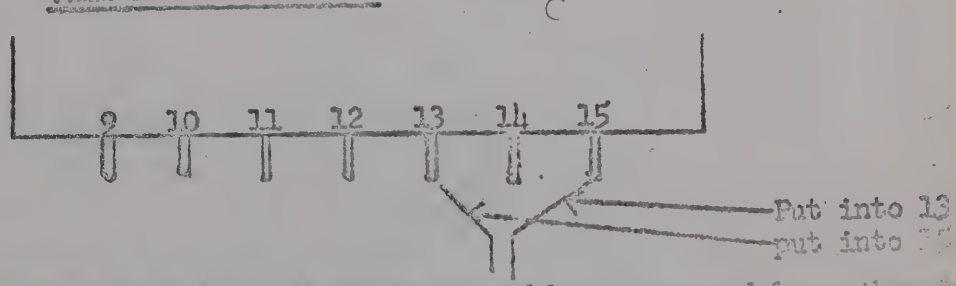
Plug the MA.6300 into the rear of the receiver. DO NOT CONNECT TO T A. C: LINE.

Locate the -16 V REG terminal on the barrier strip at the rear of the recei Connect one end of the continuity tester to this terminal and the other to one pin on the A.C. power plug. Switch the receiver to MAN. There should be no reading Connect the continuity tester to the other pin on the power plug. There should be no reading.

If a reading is measured, then one of the lines is crossed. This may be corrected as follows:

Remove the bottom plate from the receiver (8 screws). Locate the 15 pin jack J109, pins 13 and 15. Reverse the wires going to these pins.

VIEW FROM UNDERNEATH



NOTE: A reading of at least 10 ohms should be measured from the -16 V REG to the ground pin on the power plug.

Repeat the continuity checks to ensure that the lines are not now crossed.

It is now safe to use the MA. 6300.

MA. 6300 INSTRUCTION SHEET

WARNING

READ THESE INSTRUCTIONS BEFORE USING A.C. POWER UNIT/BATTERY CHARGER

It is important that a simple continuity test be made before the A.C. Power Unit/Battery Charger MA.6300 be plugged into the receiver.

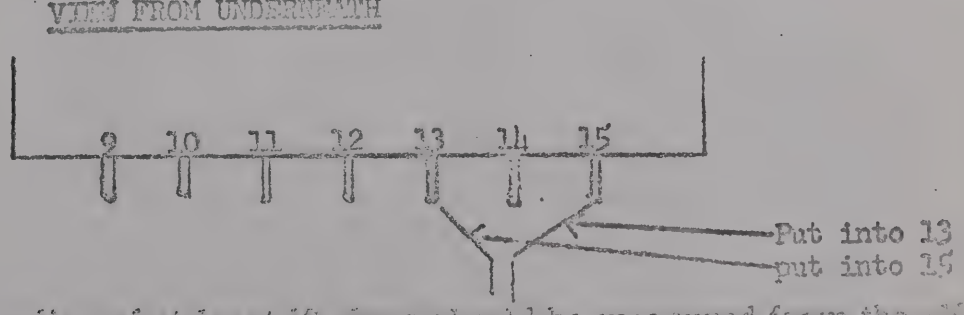
When the receiver is used with an A.C. Power Unit, both sides of the A.C. line are switched at the front panel. When the A.C. Power Unit/Battery Charger is used the -16 V is switched using one of the wires which previously carried the A.C. line. If during assembly at the plant these wires are crossed over, the A.C. line is connected to the D.C. line in the receiver resulting in permanent damage to the receiver and the MA. 6300. This has been checked at the plant but must be rechecked in view of the damage that would result if an error was made. In order to ensure that this does not happen, a simple test must be made.

Plug the MA.6300 into the rear of the receiver. DO NOT CONNECT TO THE A. C. LINE.

Locate the -16 V REG terminal on the barrier strip at the rear of the receiver Connect one end of the continuity tester to this terminal and the other to one pin on the A.C. power plug. Switch the receiver to MAN. There should be no reading Connect the continuity tester to the other pin on the power plug. There should be no reading.

If a reading is measured, then one of the lines is crossed. This may be corrected as follows:

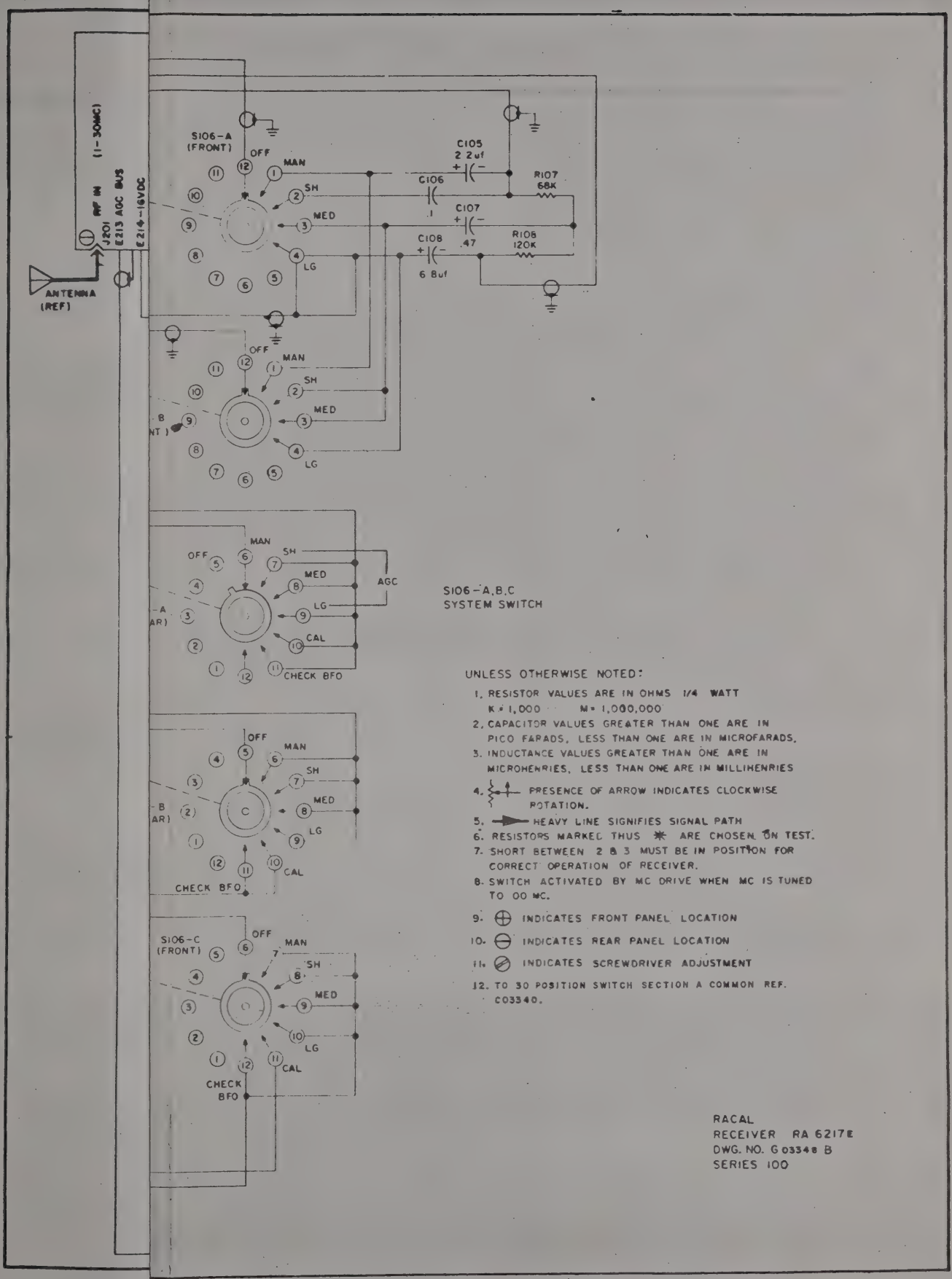
Remove the bottom plate from the receiver (8 screws). Locate the 15 pin jack J109, pins 13 and 15. Reverse the wires going to these pins.



NOTE: A reading of at least 10 ohms should be measured from the -16 V REG to the ground pin on the power plug.

Repeat the continuity checks to ensure that the lines are not now crossed.

It is now safe to use the MA. 6300.

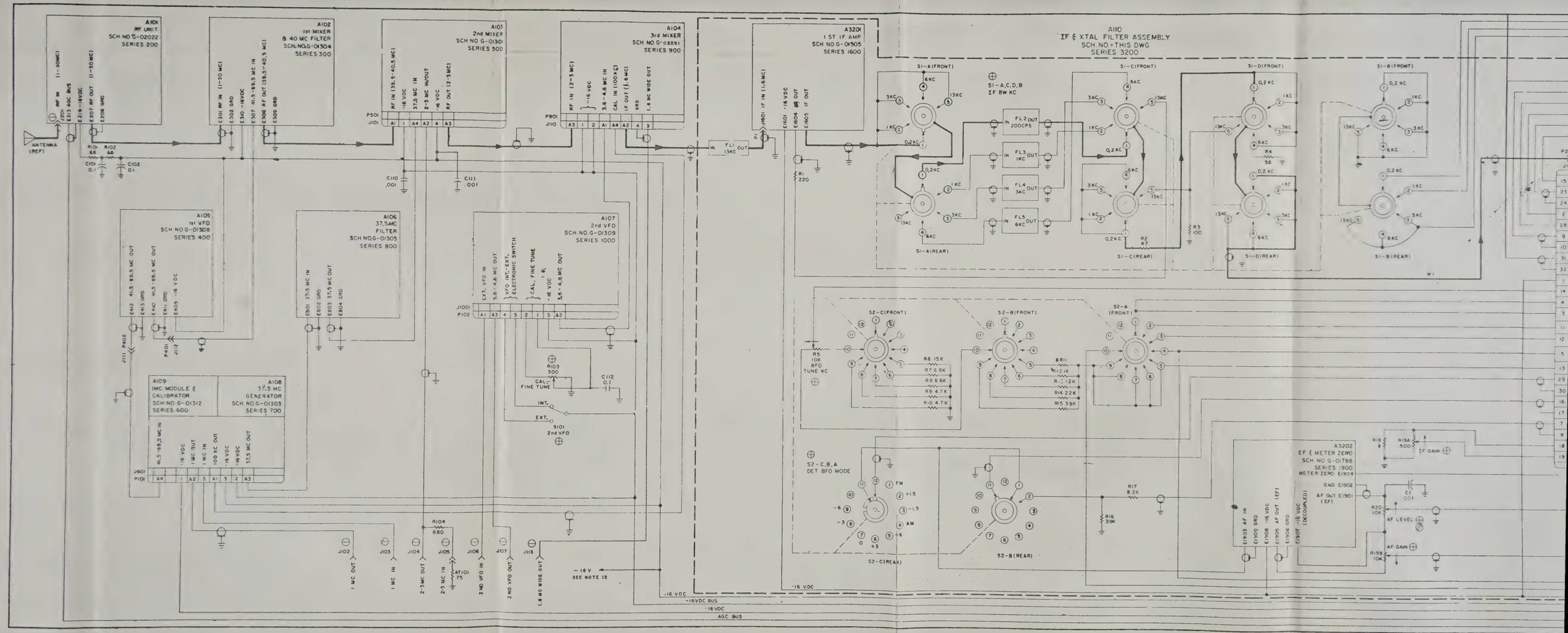


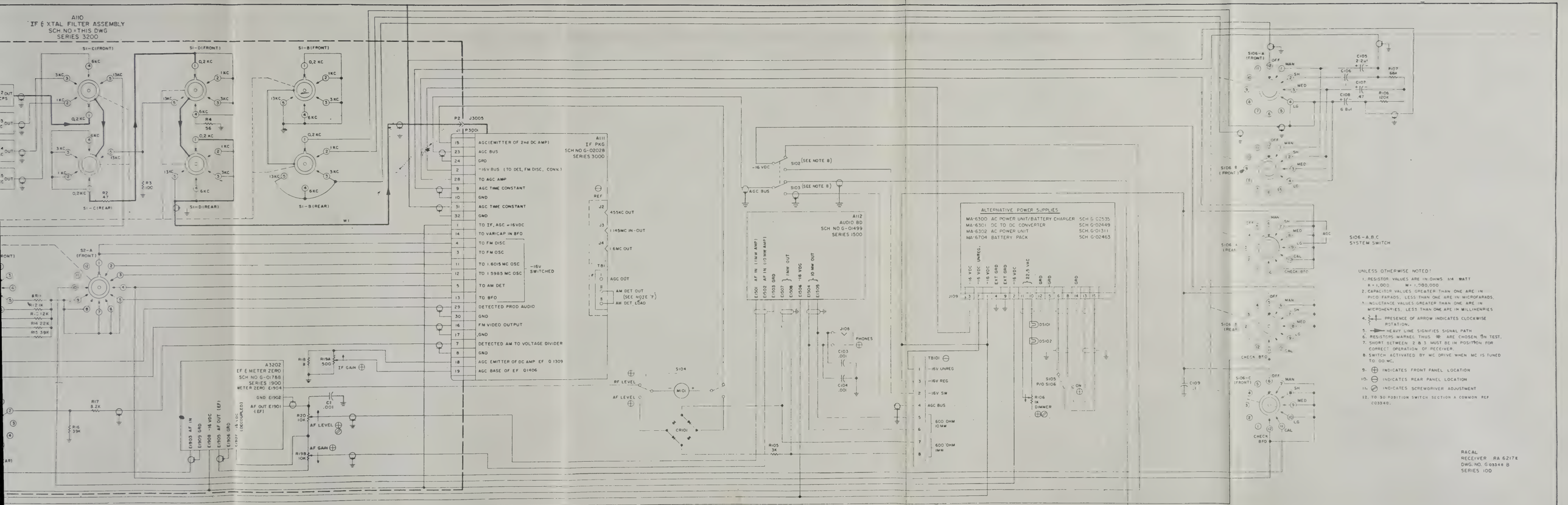
S106-A,B,C
SYSTEM SWITCH

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION.
5. HEAVY LINE SIGNIFIES SIGNAL PATH
6. RESISTORS MARKED THUS * ARE CHOSEN ON TEST.
7. SHORT BETWEEN 2 & 3 MUST BE IN POSITION FOR CORRECT OPERATION OF RECEIVER.
8. SWITCH ACTIVATED BY MC DRIVE WHEN MC IS TUNED TO 00 MC.
9. ⊕ INDICATES FRONT PANEL LOCATION
10. ⊖ INDICATES REAR PANEL LOCATION
11. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
12. TO 30 POSITION SWITCH SECTION A COMMON REF. C03340.

RACAL
RECEIVER RA 6217E
DWG. NO. G 03348 B
SERIES 100

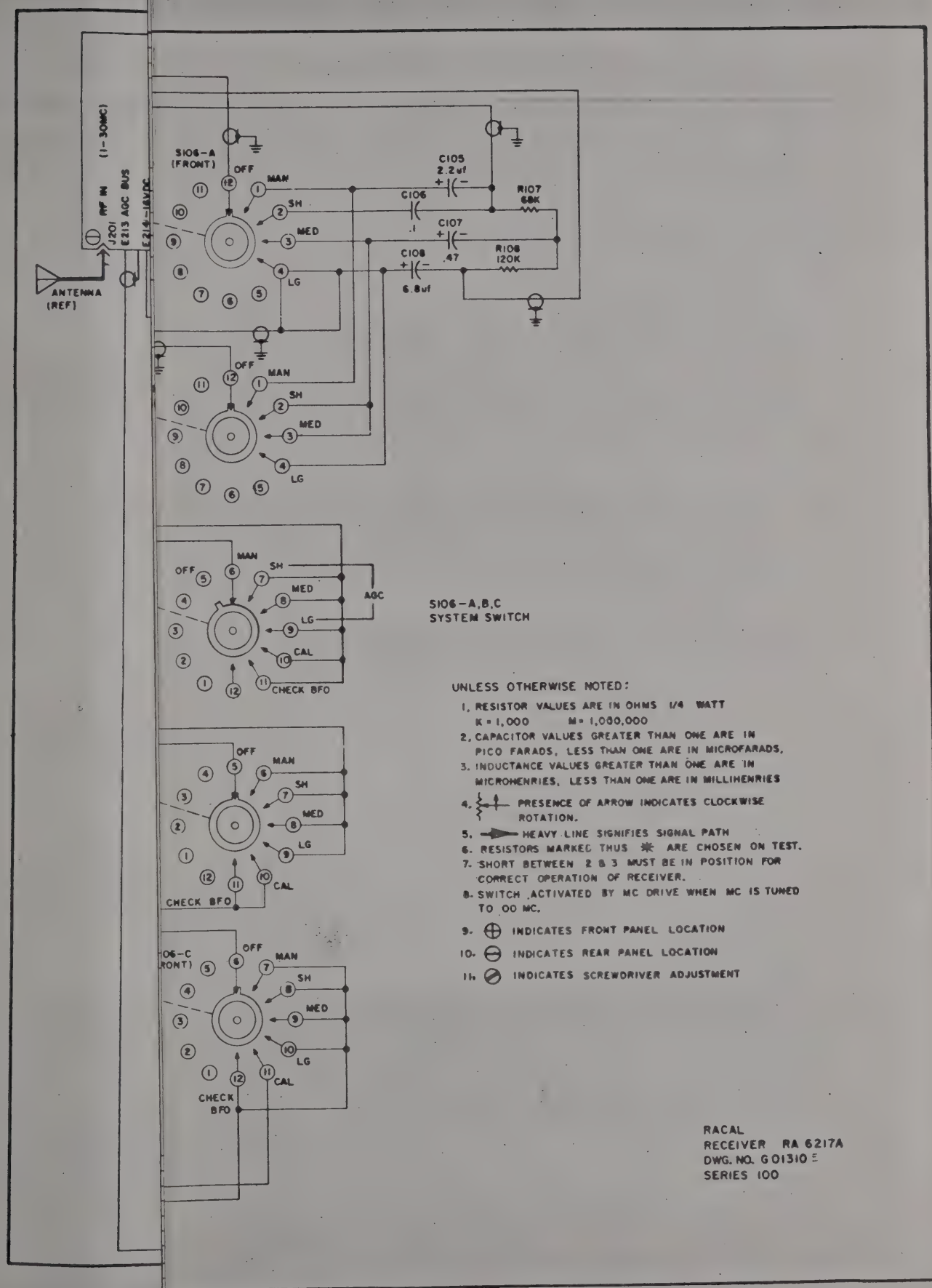

A101
RF UNIT
SCH NO G-02022
SERIES 200
A102
1st MIXER
& 40 MC FILTER
SCH. NO. G-01304
SERIES 300
A103
2nd MIXER
SCH NO G-01301
SERIES 500
A104
3rd MIXER
SCH NO G-02291
SERIES 900
A3201
1 ST IF AMP
SCH NO G-01505
SERIES 1600
A110
IF & XTAL FILTER ASSEMBLY
SCH NO = THIS DWG
SERIES 3200
A105
1st VFO
SCH NO G-01308
SERIES 400
A106
37.5MC
FILTER
SCH. NO. G-01305
SERIES 800
A107
2nd VFO
SCH. NO. G-01309
SERIES 1000
A109
IMC MODULE & CALIBRATOR
SCH NO G-01312
SERIES 600
A108
37.5 MC
GENERATOR
SCH. NO. G-01303
SERIES 700
A3202
EF & METER ZERO
SCH NO G-01788
SERIES 1900
METER ZERO E1904
ANTENNA (REF)
S1-A,C,D,B IF BW KC
FL2 200CPS
FL3 1KC
FL4 3KC
FL5 6KC
S1-A(FRONT)
S1-A(REAR)
S1-C(FRONT)
S1-C(REAR)
S1-D(FRONT)
S1-D(REAR)
S1-B(FRONT)
S1-B(REAR)
S2-C(FRONT)
S2-B(FRONT)
S2-A (FRONT)
S2-C(REAR)
S2-B(REAR)
S2-C,B,A DET BFO MODE
R5 10K BFO TUNE KC
R6 15K
R7 6.8K
R8 6.8K
R9 4.7K
R10 4.7K
R11 12K
R12 1K
R13 12K
R14 22K
R15 39K
R16 39K
R17 8.2K
R18 500
R19A 500
IF GAIN
AF LEVEL
AF GAIN
R20 10K
C1 .001
R103 500
CAL-FINE TUNE
C112 0.1
INT.
EXT.
S101 2nd VFO
R104 680
AT101 75
-16 V SEE NOTE 12
-16 VDC
-16VDC BUS
AGC BUS
1 MC OUT
1 MC IN
2-3 MC OUT
2-3 MC IN
2 ND VFO IN
2 ND VFO OUT
1.8 MC WIDE OUT

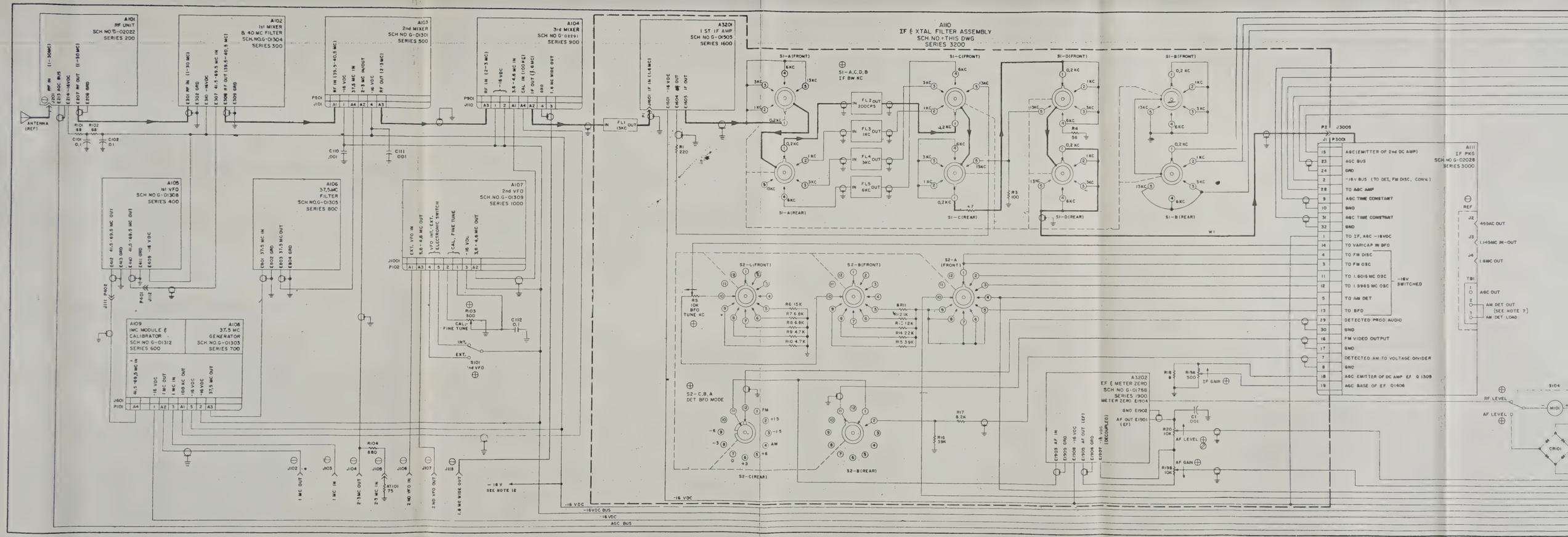


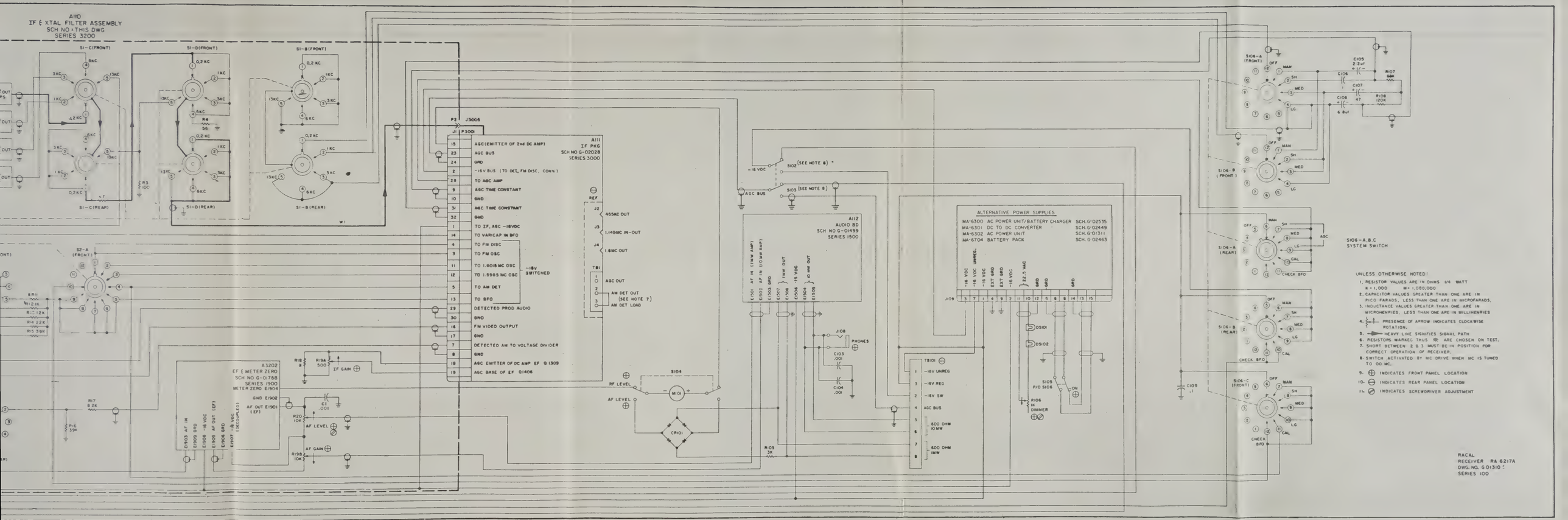
UNLESS OTHERWISE NOTED:

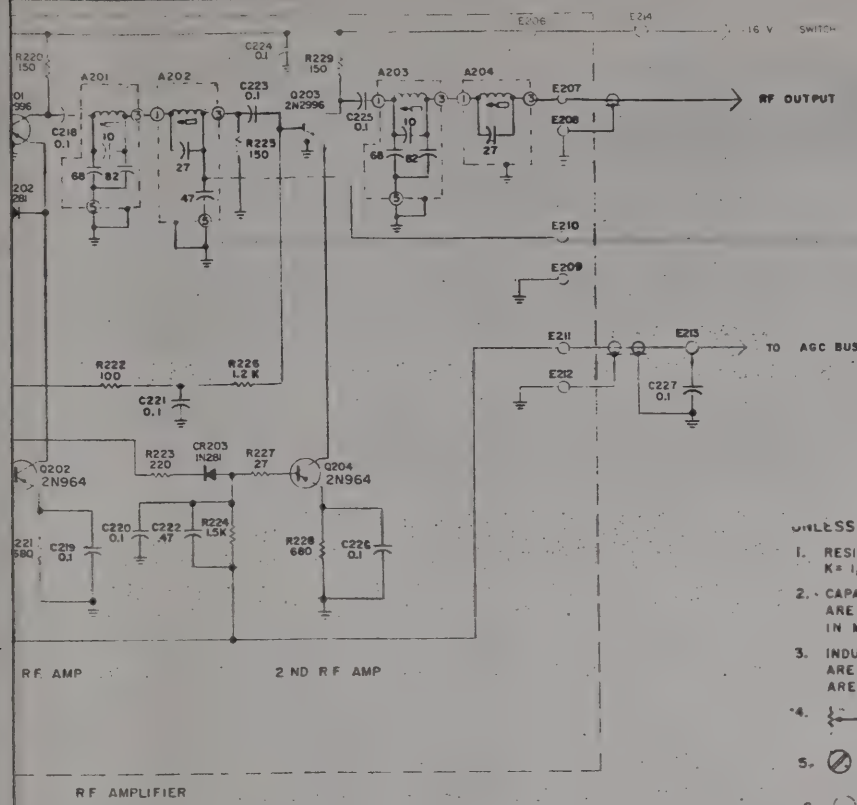
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS. LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES. LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION.
5. HEAVY LINE SIGNIFIES SIGNAL PATH
6. RESISTORS MARKED THUS ※ ARE CHOSEN ON TEST.
7. SHORT BETWEEN 2 & 3 MUST BE IN POSITION FOR CORRECT OPERATION OF RECEIVER.
8. SWITCH ACTIVATED BY MC DRIVE WHEN MC IS TUNED TO 100 MC.
9. ⊕ INDICATES FRONT PANEL LOCATION
10. ⊖ INDICATES REAR PANEL LOCATION
11. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
12. TO SO POSITION SWITCH SECTION A COMMON REF C03340.

RACAL
RECEIVER RA 6217E
DWG. NO. G03348 B
SERIES 100


RF IN (1-30MC)
J201
E213 AGC BUS
E214 -18VDC
ANTENNA (REF)
S106-A (FRONT)
OFF
MAN
SH
MED
LG
C105 2.2uf
C106 .1
C107 .47
C108 6.8uf
R107 68K
R108 120K
AGC
CAL
CHECK BFO
S106-A,B,C
SYSTEM SWITCH
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS,
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION.
5. HEAVY LINE SIGNIFIES SIGNAL PATH
6. RESISTORS MARKED THUS ✱ ARE CHOSEN ON TEST.
7. SHORT BETWEEN 2 & 3 MUST BE IN POSITION FOR CORRECT OPERATION OF RECEIVER.
8. SWITCH ACTIVATED BY MC DRIVE WHEN MC IS TUNED TO 00 MC.
9. ⊕ INDICATES FRONT PANEL LOCATION
10. ⊖ INDICATES REAR PANEL LOCATION
11. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
RACAL
RECEIVER RA 6217A
DWG. NO. G01310 E
SERIES 100


A101
RF UNIT
SCH NO G-02022
SERIES 200
A102
1st MIXER
& 40 MC FILTER
SCH NO G-01304
SERIES 300
A103
2nd MIXER
SCH NO G-01301
SERIES 500
A104
3rd MIXER
SCH NO G-02291
SERIES 900
A3201
1 ST IF AMP
SCH NO G-01303
SERIES 1600
A110
IF & XTAL FILTER ASSEMBLY
SCH NO THIS DWG
SERIES 3200
A105
1st VFO
SCH NO G-01308
SERIES 400
A106
37.5MC
FILTER
SCH NO G-01305
SERIES 800
A107
2nd VFO
SCH NO G-01309
SERIES 1000
A109
IMC MODULE & CALIBRATOR
SCH NO G-01312
SERIES 600
A108
37.5 MC
GENERATOR
SCH NO G-01303
SERIES 700
A3202
EF & METER ZERO
SCH NO G-01768
SERIES 1900
METER ZERO E1904
A111
IF PKG
SCH NO G-03028
SERIES 3000
ANTENNA (REF)
S1-A,C,D,B IF BW KC
S1-A(FRONT)
S1-A(REAR)
S1-C(FRONT)
S1-C(REAR)
S1-D(FRONT)
S1-D(REAR)
S1-B(FRONT)
S1-B(REAR)
S2-L(FRONT)
S2-B(FRONT)
S2-A (FRONT)
S2-C,B,A DET BFO MODE
S2-C(REAR)
S2-B(REAR)
FL2 OUT 2000CPS
FL3 OUT 1KC
FL4 OUT 3KC
FL5 OUT 6KC
FL1 13KC OUT
P3 J3005
J1 P3001
15 AGC (EMITTER OF 2nd DC AMP)
23 AGC BUS
24 GND
2 -16V BUS (TO DET, FM DISC, CONV.)
28 TO AGC AMP
9 AGC TIME CONSTANT
10 GND
31 AGC TIME CONSTANT
32 GND
1 TO IF, AGC -16VDC
14 TO VARICAP IN BFO
4 TO FM DISC
3 TO FM OSC
11 TO 1.6015 MC OSC
12 TO 1.5985 MC OSC
-16V SWITCHED
5 TO AM DET
13 TO BFO
29 DETECTED PROD AUDIO
30 GND
16 FM VIDEO OUTPUT
17 GND
7 DETECTED AM-TO VOLTAGE DIVIDER
8 GND
18 AGC EMITTER OF DC AMP EF Q 1309
19 AGC BASE OF EF Q1408
J2 455KC OUT
J3 1.1454MC IN-OUT
J4 1.6MC OUT
TB1
AGC OUT
AM DET OUT (SEE NOTE 7)
AM DET LOAD
RF LEVEL
AF LEVEL
IF GAIN
AF GAIN
AF OUT (EF)
-16 VDC (DECOUPLED)
1 MC OUT
1 MC IN
2nd VFO IN
2nd VFO OUT
1.6 MC WIDE OUT
-16 VDC
-16VDC BUS
AGC BUS


A110
IF & XTAL FILTER ASSEMBLY
SCH NO. THIS DWG
SERIES 3200
S1-C(FRONT)
S1-D(FRONT)
S1-B(FRONT)
S1-C(REAR)
S1-D(REAR)
S1-B(REAR)
P3 J3005
J1 P3001
A111
IF PKG
SCH NO G-02028
SERIES 3000
AGC(EMITTER OF 2nd DC AMP)
AGC BUS
GND
-16 V BUS (TO DET, FM DISC, CONV'S.)
TO AGC AMP
AGC TIME CONSTANT
GND
AGC TIME CONSTANT
GND
TO IF, AGC -18VDC
TO VARICAP IN BFO
TO FM DISC
TO FM OSC
TO 1.6018 MC OSC
TO 1.5985 MC OSC
-18V SWITCHED
TO AM DET
TO BFO
DETECTED PROD AUDIO
GND
FM VIDEO OUTPUT
GND
DETECTED AM TO VOLTAGE DIVIDER
GND
AGC EMITTER OF DC AMP EF Q1309
AGC BASE OF EF Q1406
REF
J2 455KC OUT
J3 1.4585MC IN-OUT
J4 1.8MC OUT
TB1
AGC OUT
AM DET OUT (SEE NOTE 7)
AM DET LOAD
A112
AUDIO BD
SCH NO G-01499
SERIES 1500
E1001 AF IN (1MW AMP)
E1002 AF IN (10 MW AMP)
E1003 GND
E1007 +6W OUT
E1008 -15 VDC
E1004 +10 MW OUT
E1005
-16 VDC
SW
-16 VDC UNREG.
-16 VDC
EXT GRD
EXT GRD
-16 VDC
22.5 VAC
GND
GND
GND
J109
ALTERNATIVE POWER SUPPLIES
MA-6300 AC POWER UNIT/BATTERY CHARGER SCH.G-02535
MA-6301 DC TO DC CONVERTER SCH.G-02449
MA-6302 AC POWER UNIT SCH.G-01311
MA-6704 BATTERY PACK SCH.G-02463
S102 (SEE NOTE 8)
S103 (SEE NOTE 8)
-16 VDC
AGC BUS
J108
PHONES
C103 .001
C104 .001
TB101
-16V UNREG
-16V REG
-18V SW
AGC BUS
600 OHM 10 MW
600 OHM 1MW
R103 3K
DS101
DS102
S105 P/O S106
ON
R106 1K DIMMER
C109 .1
S106-A (FRONT)
S106-B (FRONT)
S106-A (REAR)
S106-B (REAR)
S106-C (FRONT)
S106-C (REAR)
OFF
MAN
SM
MED
LG
CAL
CHECK BFO
AGC
C105 2.2uf
C106 .1
C107 .47
C108 6.8uf
R107 68K
R108 120K
S106-A,B,C
SYSTEM SWITCH
S2-A (FRONT)
S2-B (REAR)
R11 W12 1K
R12 12K
R14 22K
R15 39K
R16 39K
R17 8.2K
A3202
EF & METER ZERO
SCH NO G-01788
SERIES 1900
METER ZERO E1904
GND E1902
AF OUT E1901 (EF)
E1903 AF IN
E1909 GND
E1908 -16 VDC
E1905 AF OUT (EF)
E1904 GND
E1907 -18 VDC (SCOPE)
R18 8
R19A 500
IF GAIN
C1 .001
R20 10K
AF LEVEL
R19B 10K
AF GAIN
S104
RF LEVEL
AF LEVEL
M101
CR101
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO-FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION.
5. HEAVY LINE SIGNIFIES SIGNAL PATH
6. RESISTORS MARKED THUS ⌀R ARE CHOSEN ON TEST.
7. SHORT BETWEEN 2 & 3 MUST BE IN POSITION FOR CORRECT OPERATION OF RECEIVER.
8. SWITCH ACTIVATED BY MC DRIVE WHEN MC IS TUNED TO 00 MC.
9. ⊕ INDICATES FRONT PANEL LOCATION
10. ⊖ INDICATES REAR PANEL LOCATION
11. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
RACAL
RECEIVER RA 6217A
DWG. NO. G01310
SERIES 100



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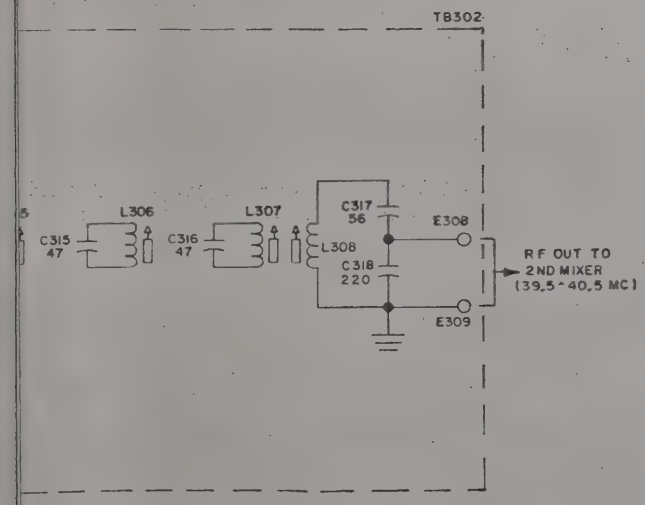
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
6. ◯ INDICATES FRONT PANEL CONTROL

RACAL RA6217
RF UNIT
DWG. NO. G02022F
SERIES 200



UNLESS OTHERWISE NOTED:

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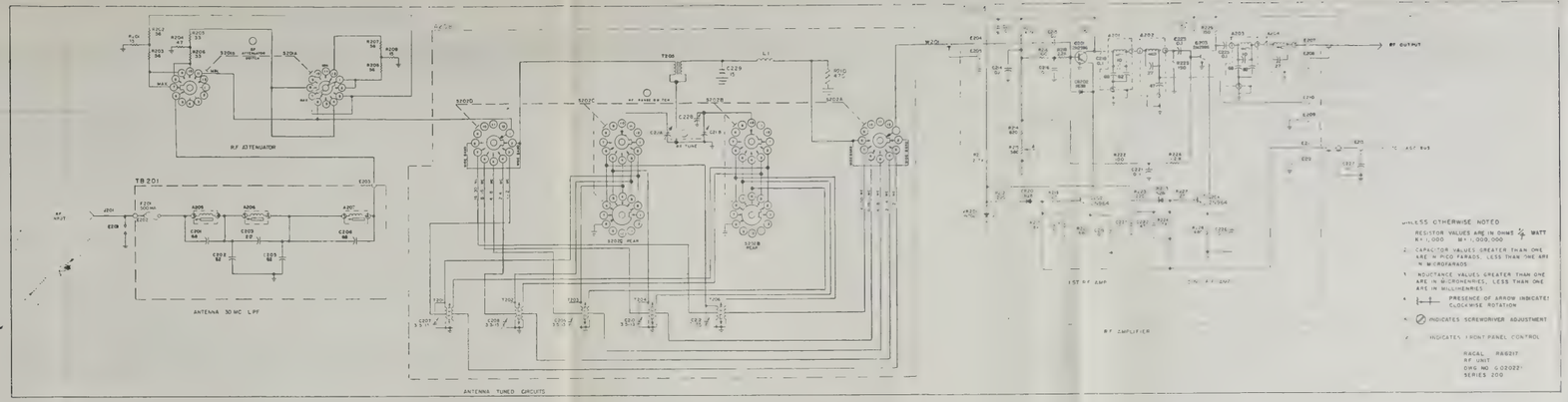
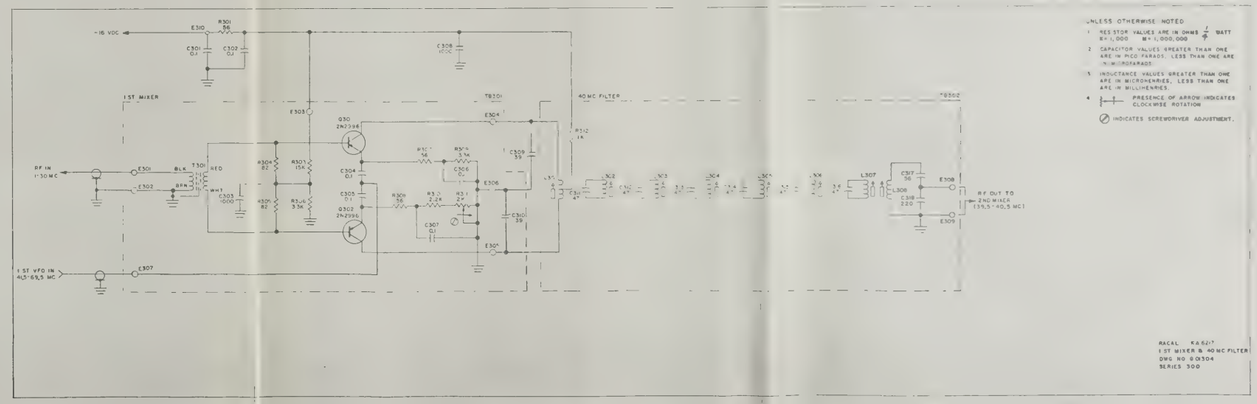
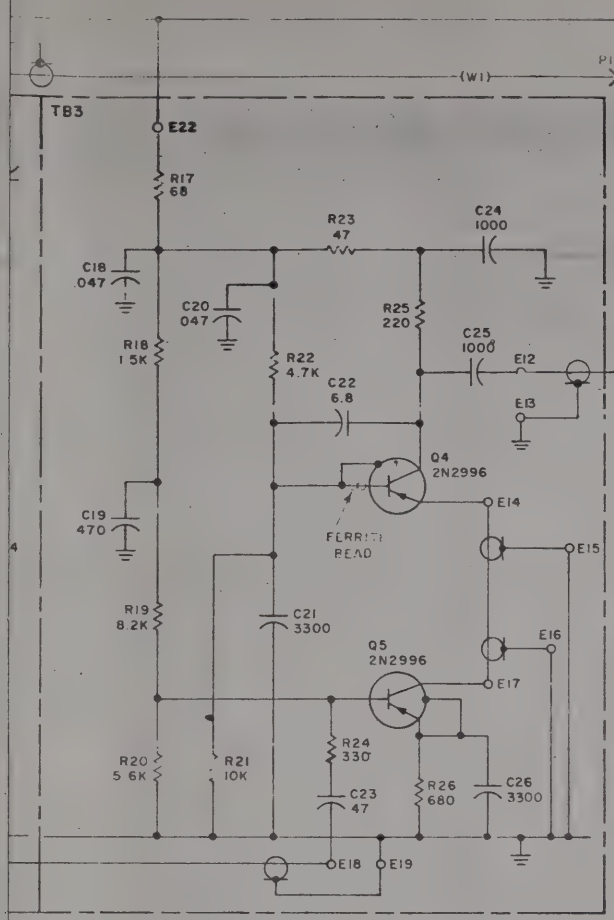
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

⊘ INDICATES SCREWDRIVER ADJUSTMENT.

RACAL RA 6217
1 ST. MIXER & 40 MC FILTER
DWG. NO. G01304
SERIES 300


RF ATTENUATOR
ANTENNA 30 MC LPF
ANTENNA TUNED CIRCUITS
1ST RF AMP
RF AMPLIFIER
RF OUTPUT
UNLESS OTHERWISE NOTED
1. RESISTOR VALUES ARE IN OHMS ¼ WATT
K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN MICRO FARADS, LESS THAN ONE ARE IN MICROFARADS
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
INDICATES FRONT PANEL CONTROL
RACAL RA621F
RF UNIT
DWG NO G 02022
SERIES 200


1ST MIXER
40 MC FILTER
RF IN (130 MC)
1ST VFO IN (41.5-69.5 MC)
RF OUT TO 2ND MIXER (131.5-140.5 MC)
UNLESS OTHERWISE NOTED
1. RESISTOR VALUES ARE IN OHMS ¼ WATT
K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN MICRO FARADS, LESS THAN ONE ARE IN MICROFARADS
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT.
RACAL RA621F
1ST MIXER & 40 MC FILTER
DWG NO G 03304
SERIES 300



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. COMPONENTS MARKED THUS * ARE NOT PHYSICALLY LOCATED ON P.C. BRD

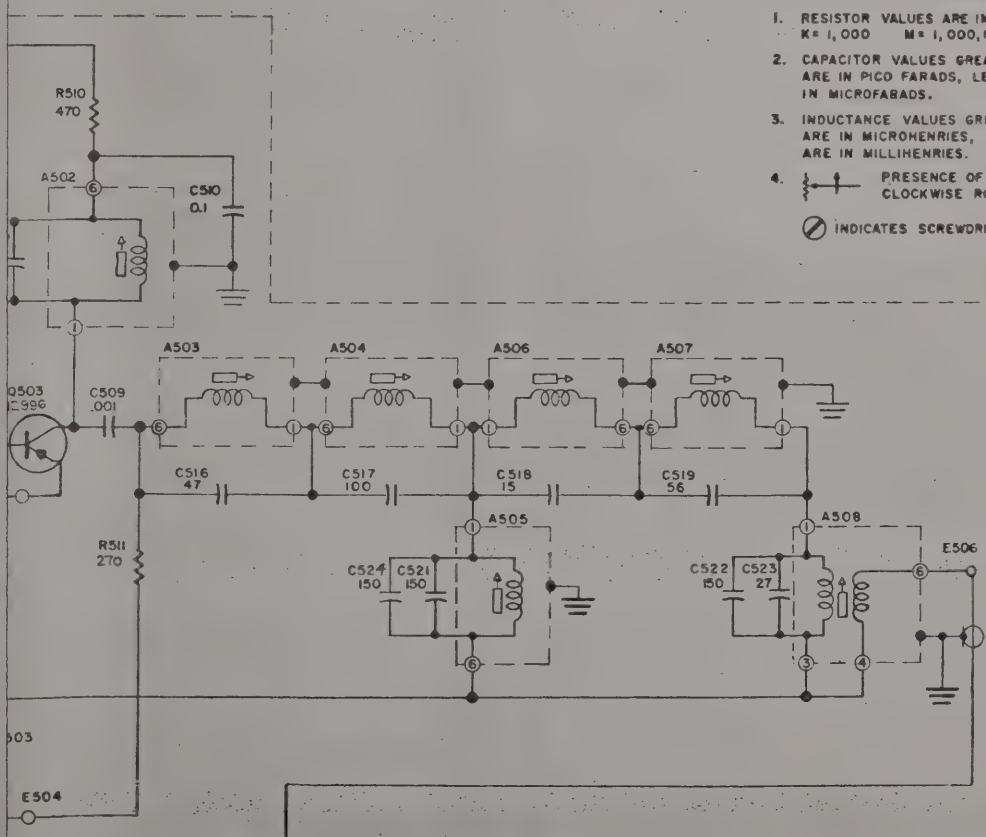
INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA 6217
IST V F O
DWG NO G-01308C
SERIES 400

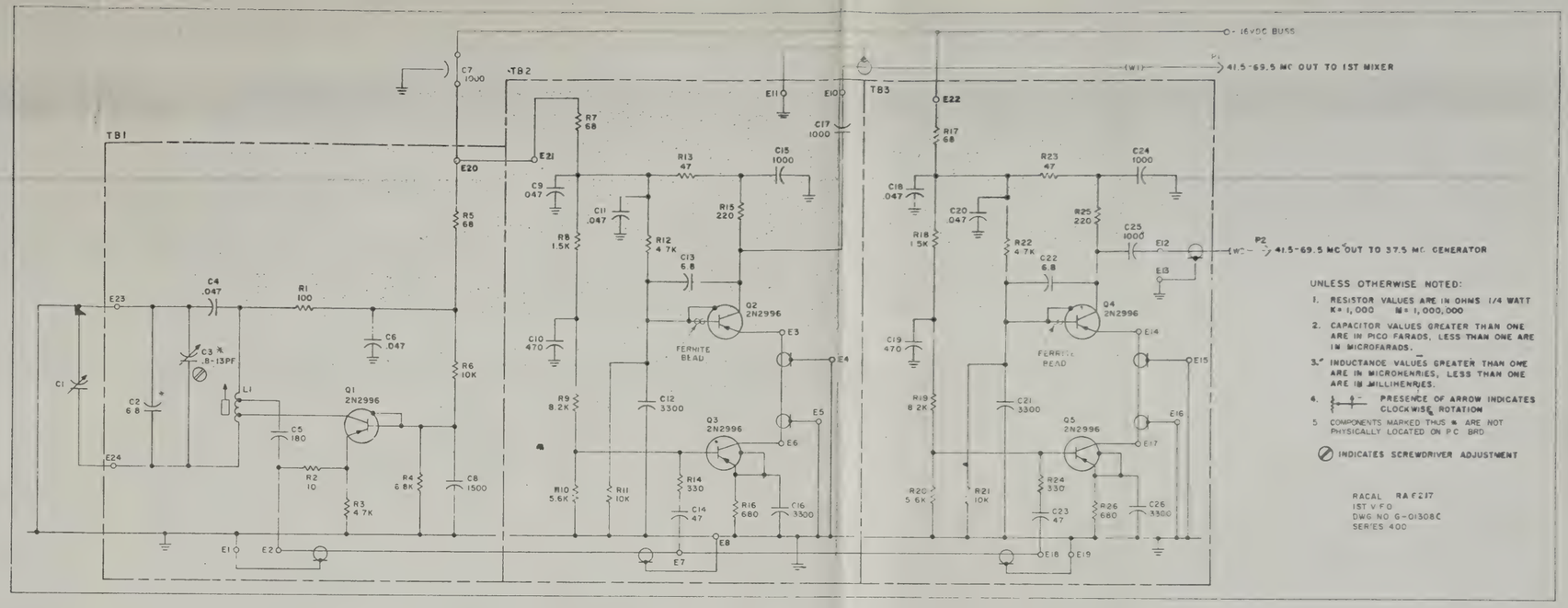
UNLESS OTHERWISE NOTED:

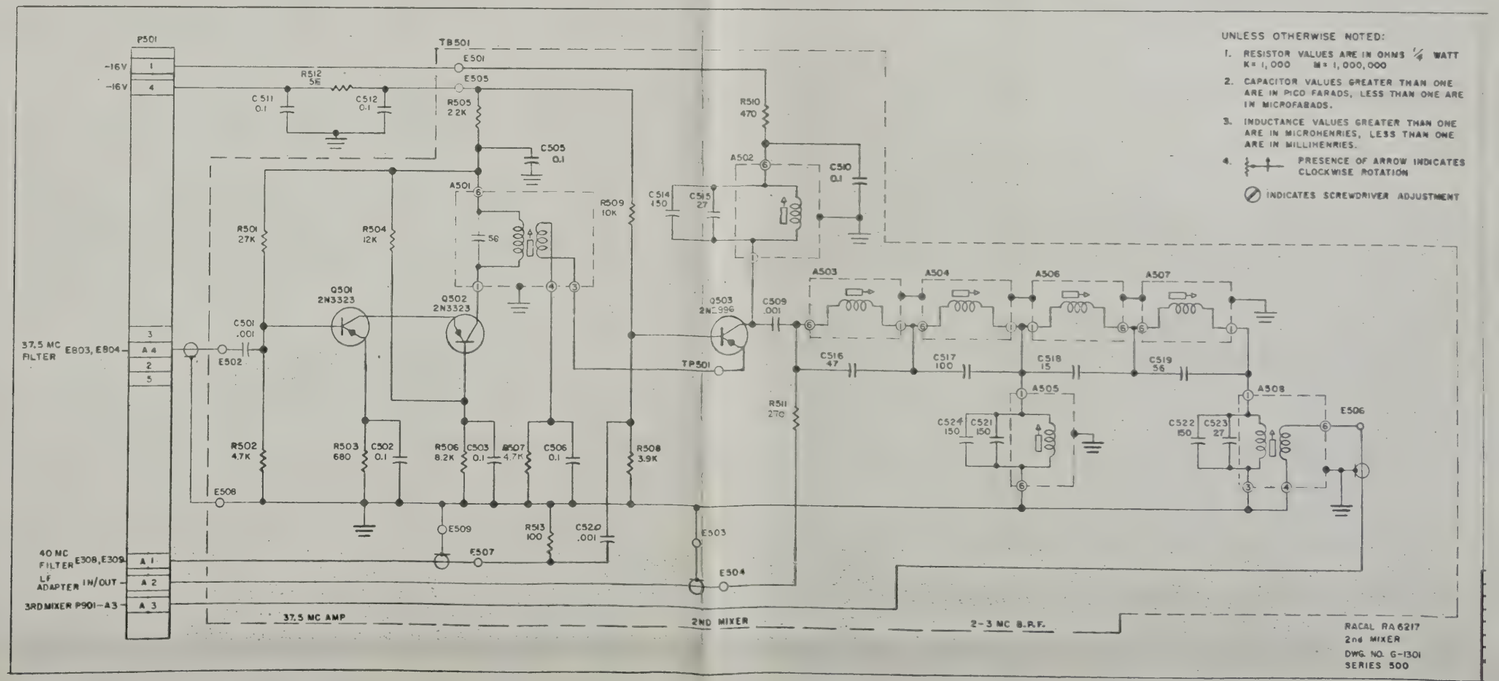
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFABADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

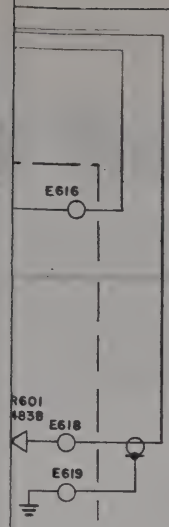
INDICATES SCREWDRIVER ADJUSTMENT



RACAL RA 6217
2nd MIXER
DWG. NO. G-1301
SERIES 500


-16VDC BUSS
41.5-69.5 MC OUT TO 1ST MIXER
41.5-69.5 MC OUT TO 37.5 MC GENERATOR
TB1
TB2
TB3
FERRITE BEAD
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. COMPONENTS MARKED THUS * ARE NOT PHYSICALLY LOCATED ON P.C. BRD.
INDICATES SCREWDRIVER ADJUSTMENT
RACAL RA 6217
1ST V.F.O.
DWG. NO. G-01308C
SERIES 400


P501
TB501
-16V
37.5 MC FILTER E803, E804
40 MC FILTER E308, E309
I.F. ADAPTER IN/OUT
3RD MIXER P901-A3
37.5 MC AMP
2ND MIXER
2-3 MC B.P.F.
TP501
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
RACAL RA 6217
2nd MIXER
DWG. NO. G-1301
SERIES 500

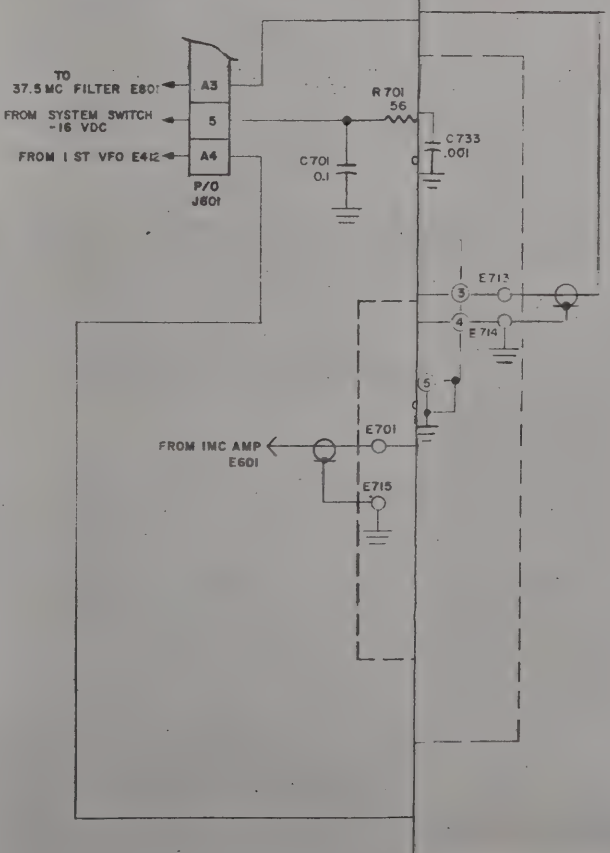


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ± WATT
   K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
I MC MODULE & CALIBRATOR
DWG NO. 6-03412 B
SERIES 600



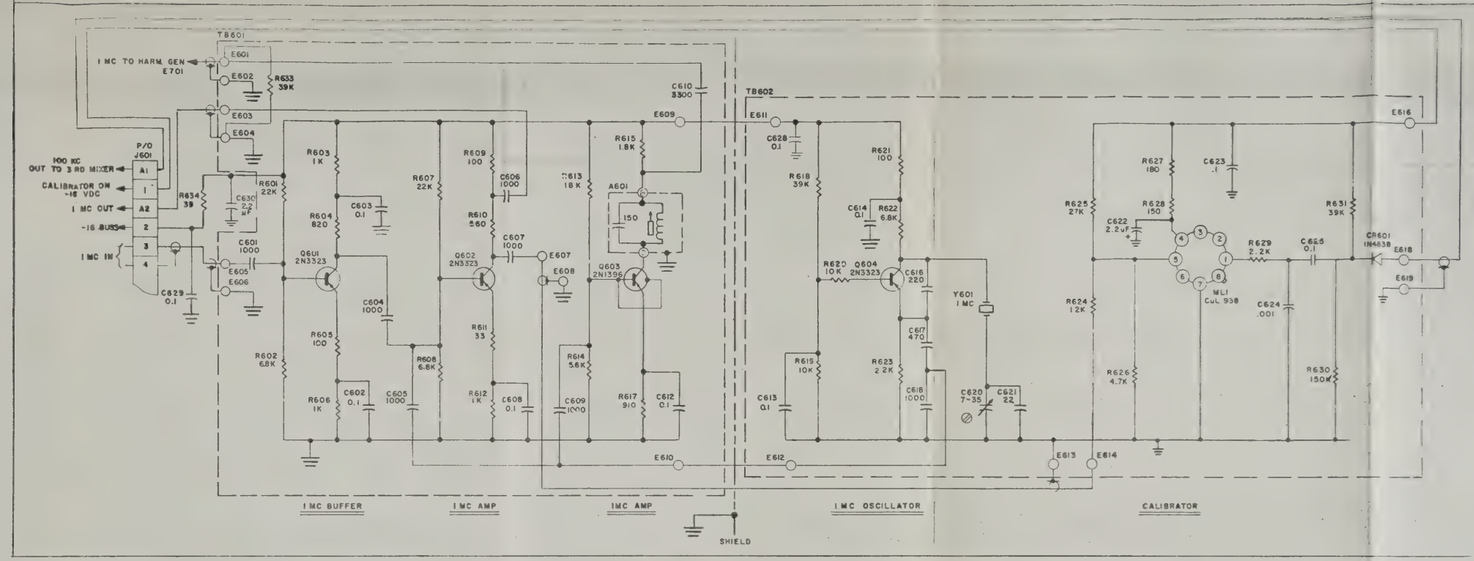
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT
   K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

5. ALL COMPONENTS INSIDE BROKEN LINES ARE MOUNTED ON P.C. BOARD.

RACAL RA6217
37.5 MC/S GENERATOR
DWG. NO. 601303
SERIES 700

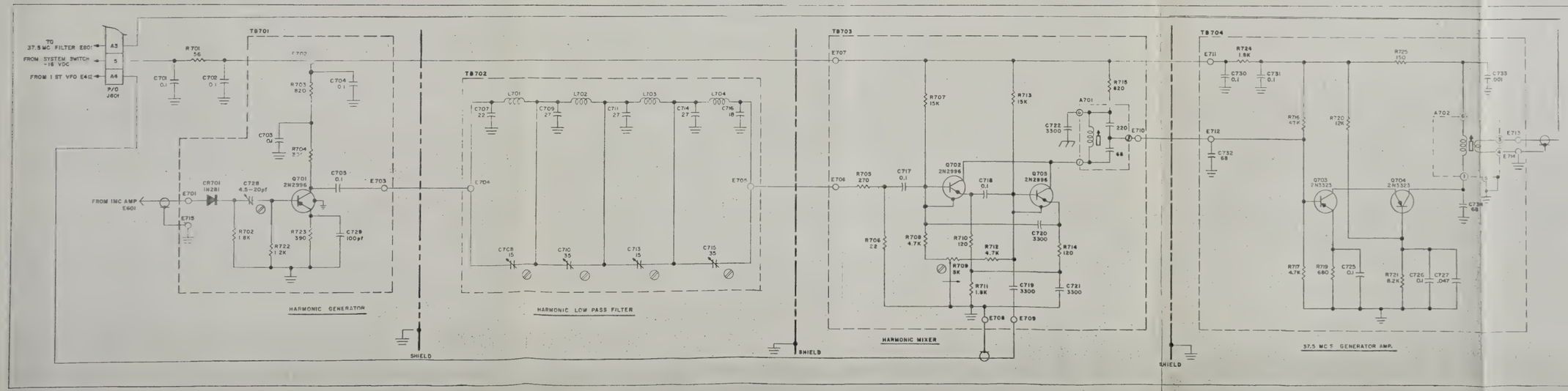


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICRONENRIES, LESS THAN ONE ARE IN MILLIENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA621-7



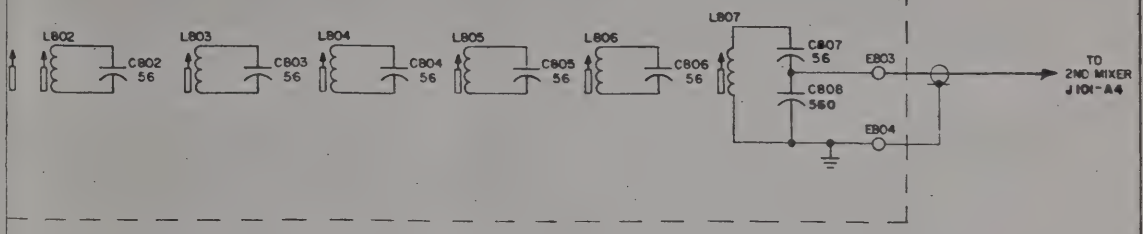
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICRONENRIES, LESS THAN ONE ARE IN MILLIENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

5. ALL COMPONENTS INSIDE BROKEN LINES ARE MOUNTED ON P.C. BOARD.

RACAL RA621-7
37.5 MC/S GENERATOR
DWG. NO. 601303
SERIES 700

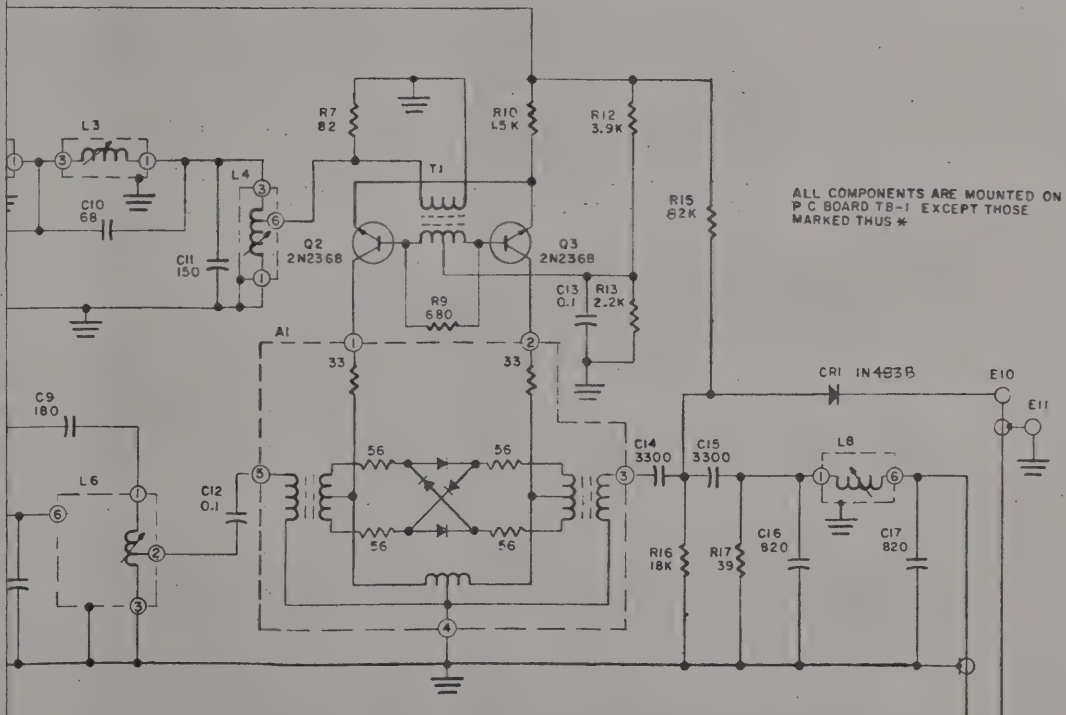


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

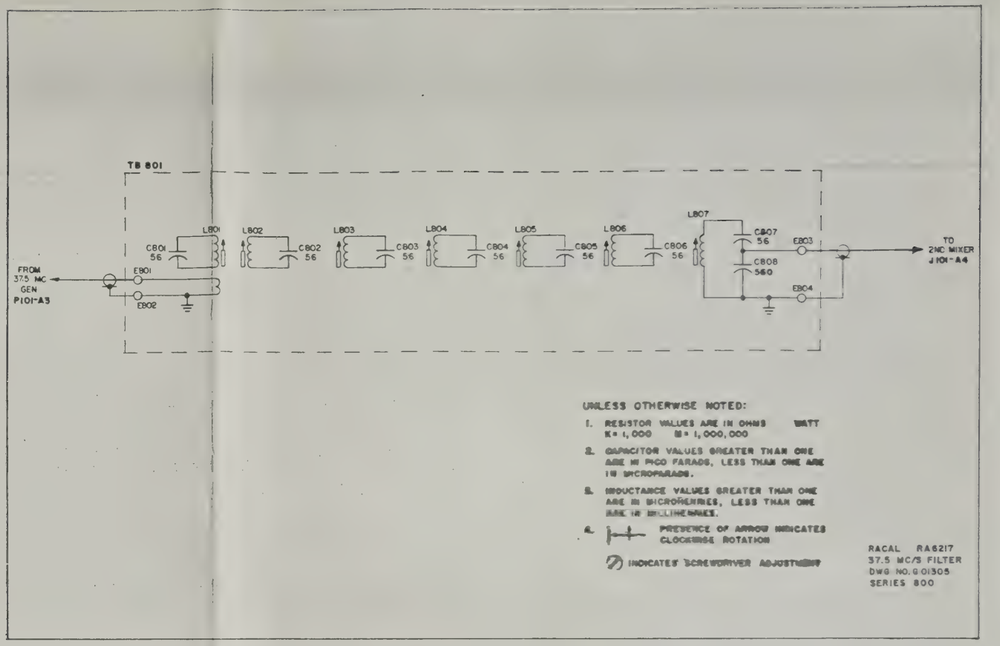
INDICATES SCREWDRIVER ADJUSTMENT

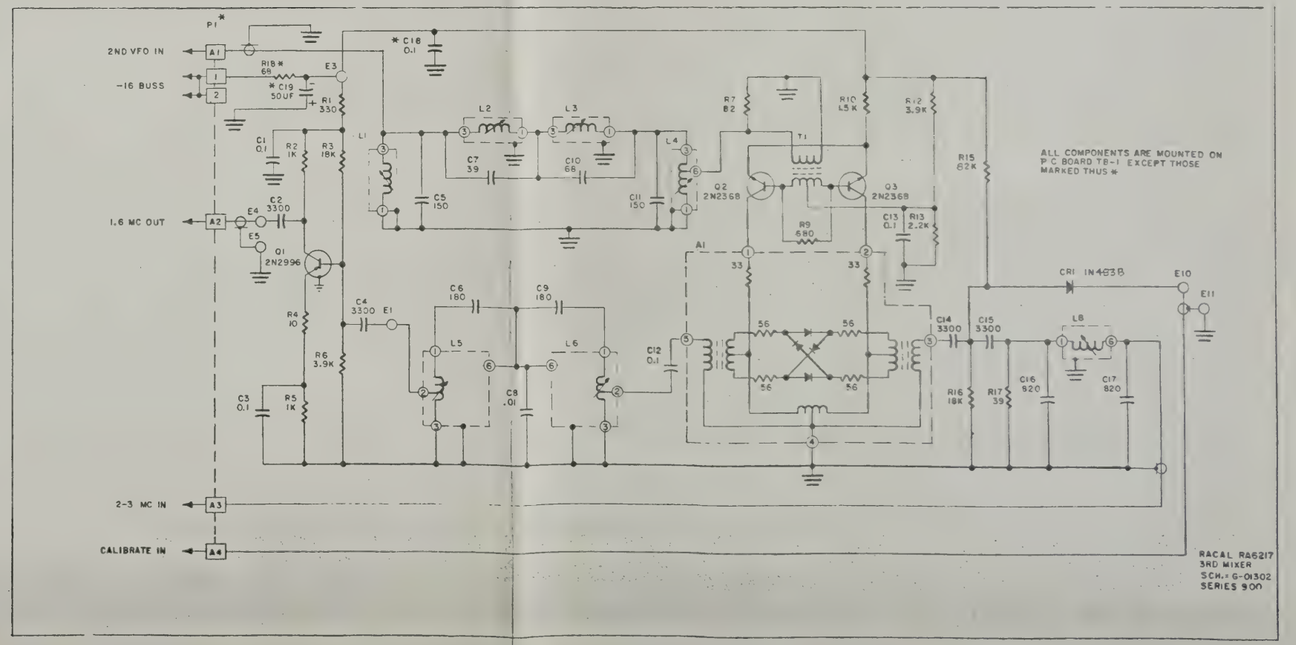
RACAL RA6217
37.5 MC/S FILTER
DWG. NO. G 01305
SERIES 800

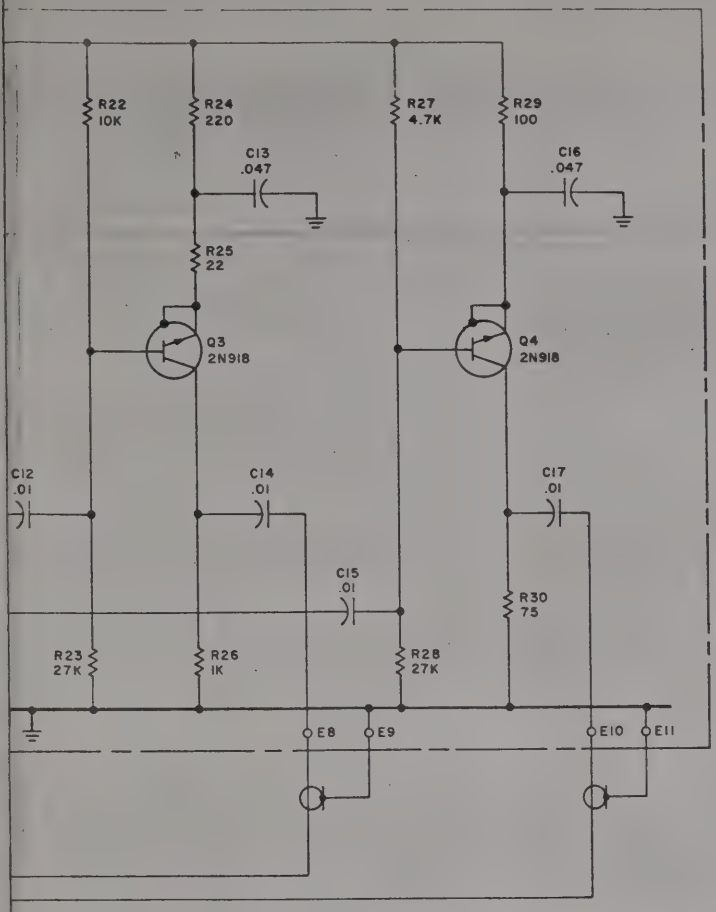


ALL COMPONENTS ARE MOUNTED ON P C BOARD TB-1 EXCEPT THOSE MARKED THUS *

RACAL RA6217
3RD MIXER
SCH.# G-01302
SERIES 900


TB 801
L801
L802
L803
L804
L805
L806
L807
C801 56
C802 56
C803 56
C804 56
C805 56
C806 56
C807 56
C808 560
E801
E802
E803
E804
FROM 375 MC GEN P101-A3
TO 2ND MIXER J101-A4
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN MICRO FARADS, LESS THAN ONE ARE IN MICROMICROS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
RACAL RA6217
37.5 MC/S FILTER
DWG NO. G 01305
SERIES 800


2ND VFO IN
-16 BUSS
1.6 MC OUT
2-3 MC IN
CALIBRATE IN
P1
A1
A2
A3
A4
E1
E2
E3
E4
E5
E10
E11
R1 330
R2 1K
R3 18K
R4 10
R5 1K
R6 3.9K
R7 82
R9 680
R10 5.6K
R12 3.9K
R13 2.2K
R15 62K
R16 18K
R17 39
C1 0.1
C2 3300
C3 0.1
C4 3300
C5 150
C6 180
C7 39
C8 .01
C9 180
C10 68
C11 150
C12 0.1
C13 0.1
C14 3300
C15 3300
C16 820
C17 820
C18 0.1
C19 50UF
L1
L2
L3
L4
L5
L6
L8
T1
Q1 2N2996
Q2 2N2368
Q3 2N2368
CR1 IN4238
ALL COMPONENTS ARE MOUNTED ON P.C. BOARD TB-1 EXCEPT THOSE MARKED THUS *
RACAL RA6217
3RD MIXER
SCH. G-01302
SERIES 900



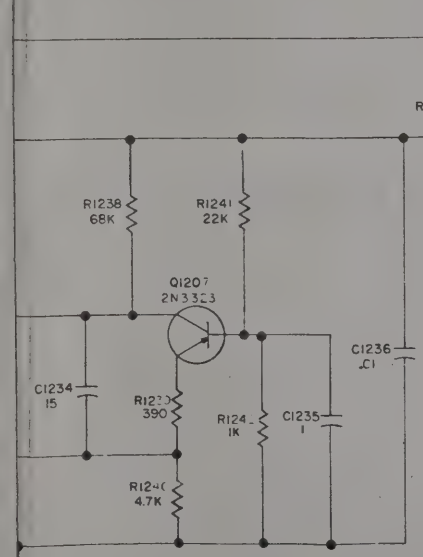
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

* PRESENCE OF ASTERISK INDICATES COMPONENT IS NOT MOUNTED ON THE BOARD.

RACAL RA 6217
2ND V.F.O.
DWG. NO. G-01309 J
SERIES 1000



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

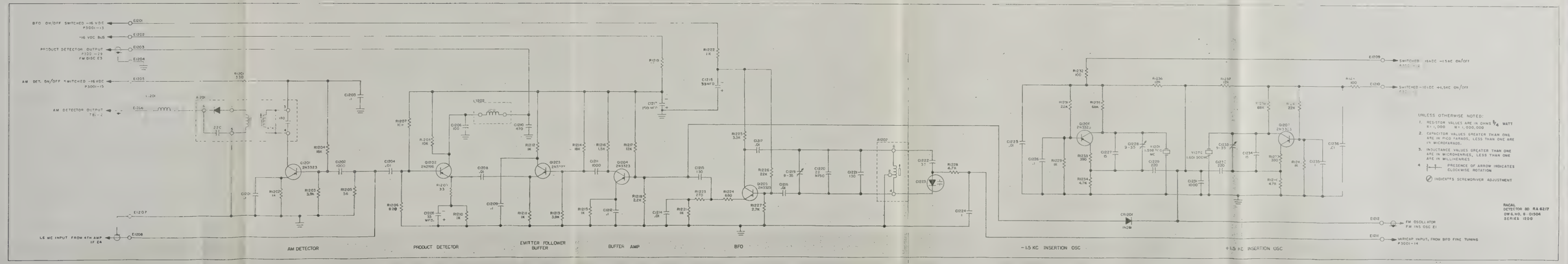
INDICATES SCREWDRIVER ADJUSTMENT

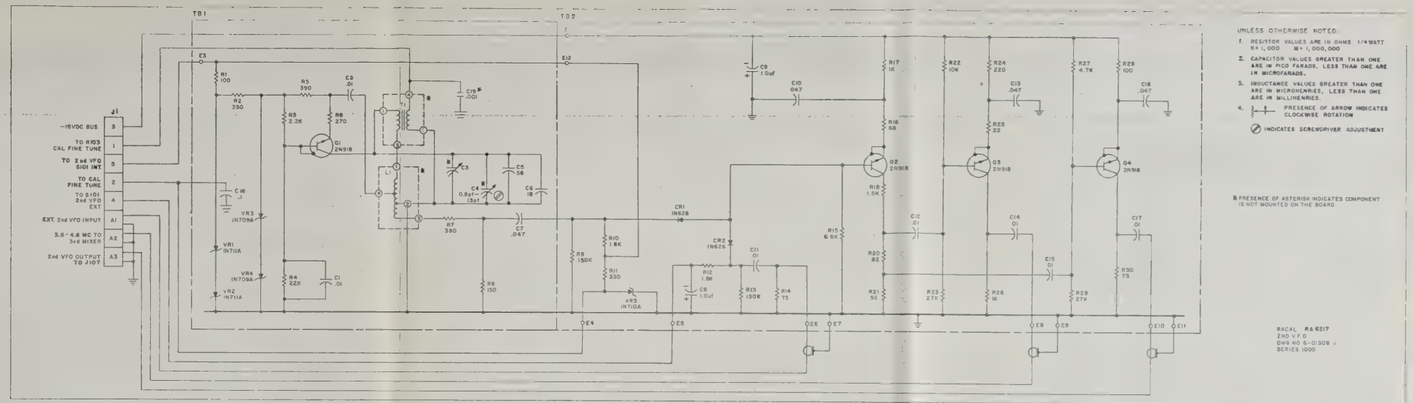
RACAL
DETECTOR BD RA 6217
DWG. NO. G-01504
SERIES 1200

E1212 → FM OSCILLATOR
FM INS OSC E1

E1211 → VARICAP INPUT, FROM BFO FINE TUNING
P3001-14

KC INSERTION OSC

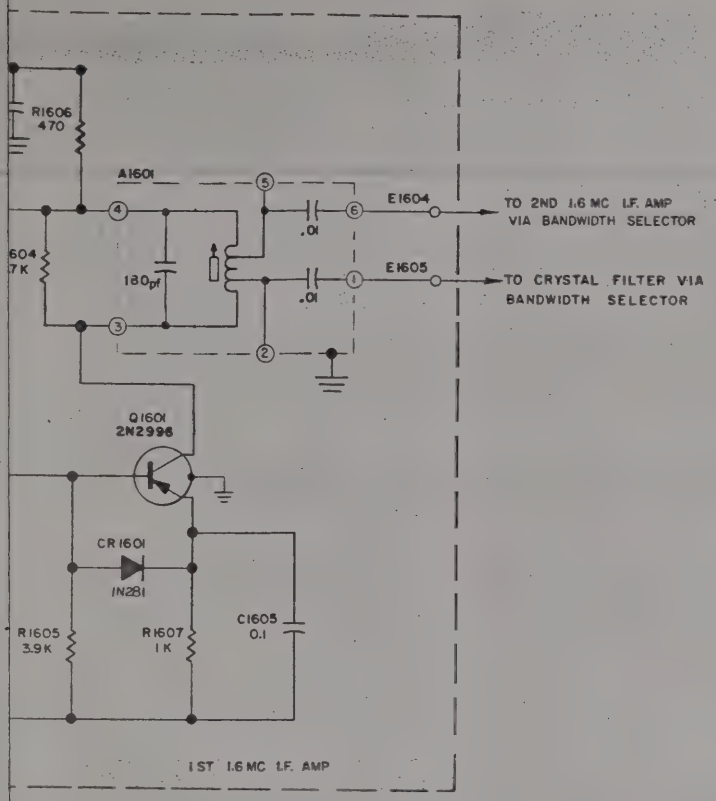

BFO ON/OFF SWITCHED -16 VDC P3001-13
-16 VDC BUS
PRODUCT DETECTOR OUTPUT P3001-29 FM DISC E3
AM DET. ON/OFF SWITCHED -16 VDC P3001-15
AM DETECTOR OUTPUT TB1-2
LO MC INPUT FROM 4TH AMP IF E4
AM DETECTOR
PRODUCT DETECTOR
EMITTER FOLLOWER BUFFER
BUFFER AMP
BFO
-1.5 KC INSERTION OSC
+1.5 KC INSERTION OSC
SWITCHED -16VDC +15VDC ON/OFF
SWITCHED -16VDC +15VDC ON/OFF
FM OSCILLATOR FM INS OSC E1
VARICAP INPUT, FROM BFO FINE TUNING P3001-14
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN MICROFARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
RACAL DETECTOR BD. RA 6217 DWG.NO. B-01504 SERIES 1000


-16VDC BUS
TO R103 CAL FINE TUNE
TO 2nd VFO SIGI INT
TO CAL FINE TUNE
TO S101 2nd VFO EXT
EXT. 2nd VFO INPUT
3.8-4.8 MC TO 3rd MIXER
2nd VFO OUTPUT TO J107
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN MICROFARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
* PRESENCE OF ASTERISK INDICATES COMPONENT IS NOT MOUNTED ON THE BOARD
RACAL RA 6217 2ND V.F.O. DWG NO B-01308 SERIES 1000

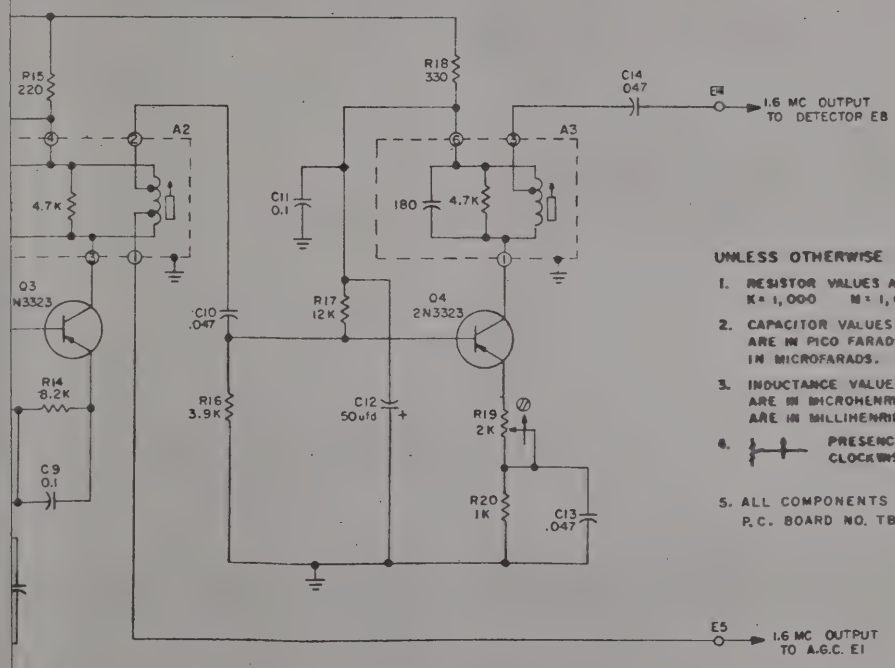
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT



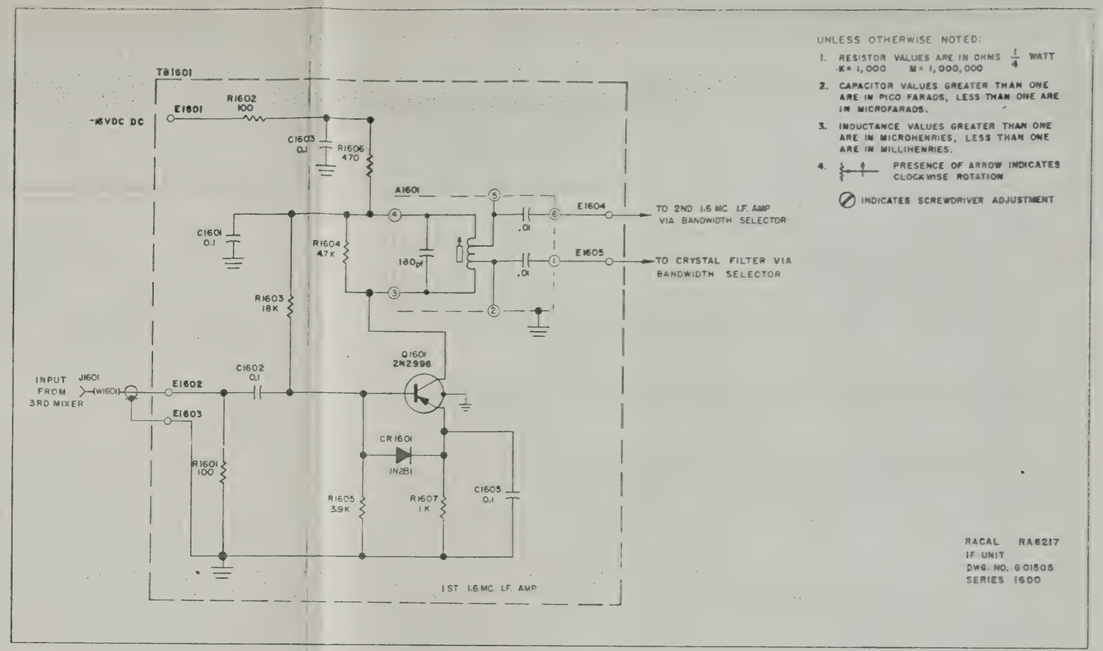
RACAL RA6217
IF UNIT
DWG. NO. G01505
SERIES 1600

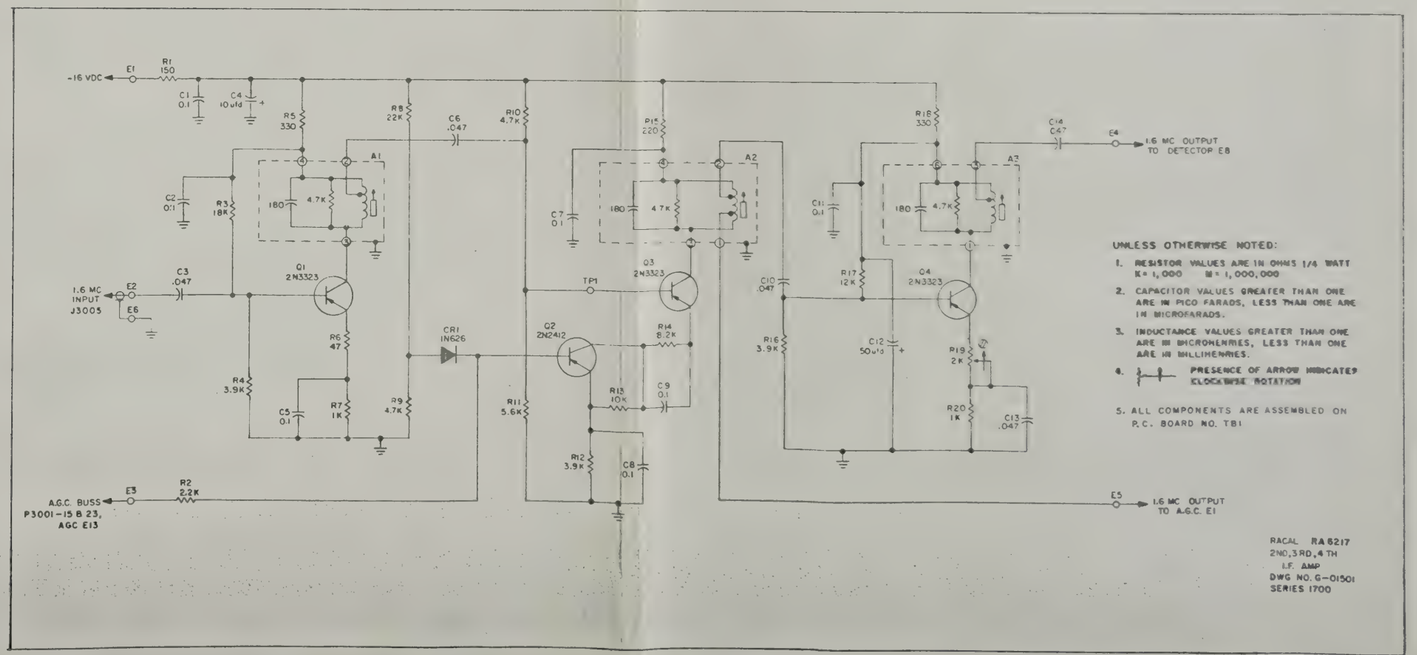


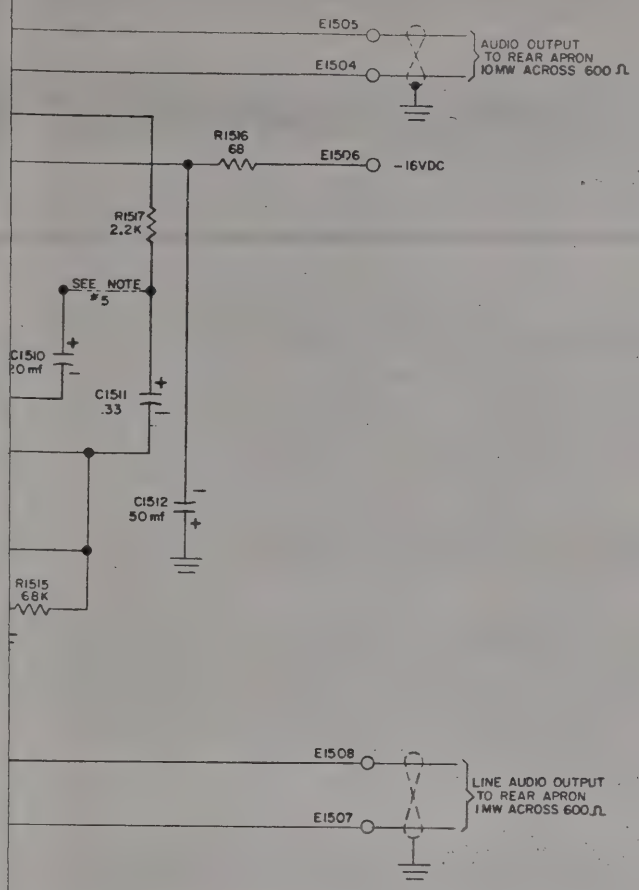
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. ALL COMPONENTS ARE ASSEMBLED ON P.C. BOARD NO. TB1

RACAL RA6217
2ND, 3RD, 4TH
I.F. AMP
DWG NO. G-01501
SERIES 1700


UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
TB1601
-16VDC DC
E1601
R1602 100
C1603 0.1
R1606 470
A1601
C1601 0.1
R1604 4.7K
180pf
E1604
TO 2ND 1.6 MC. I.F. AMP VIA BANDWIDTH SELECTOR
E1605
TO CRYSTAL FILTER VIA BANDWIDTH SELECTOR
R1603 18K
Q1601 2N2996
INPUT FROM 3RD MIXER
J1601
W1601
E1602
C1602 0.1
E1603
CR1601 IN281
R1601 100
R1605 3.9K
R1607 1K
C1605 0.1
1ST 1.6 MC I.F. AMP
RACAL RA6217
IF UNIT
DWG. NO. G01505
SERIES 1600


-16 VDC
E1
R1 150
C1 0.1
C4 10uf
R5 330
R8 22K
C6 .047
R10 4.7K
R15 220
R18 330
C14 C47
E4
1.6 MC OUTPUT TO DETECTOR E8
A1
A2
A3
C2 0.1
R3 18K
180
4.7K
C7 0.1
C11 0.1
1.6 MC INPUT J3005
E2
E6
C3 .047
Q1 2N3323
Q3 2N3323
Q4 2N3323
TP1
C10 .047
R17 12K
R6 47
CR1 IN626
Q2 2N2412
R14 8.2K
R16 3.9K
C12 50uf
R19 2K
R4 3.9K
C5 0.1
R7 1K
R9 4.7K
R11 5.6K
R13 10K
C9 0.1
R20 1K
C13 .047
R12 3.9K
C8 0.1
A.G.C. BUSS P3001-15 B 23, AGC E13
E3
R2 2.2K
E5
1.6 MC OUTPUT TO A.G.C. E1
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. ALL COMPONENTS ARE ASSEMBLED ON P.C. BOARD NO. TB1
RACAL RA6217
2ND, 3RD, 4TH I.F. AMP
DWG NO. G-01501
SERIES 1700

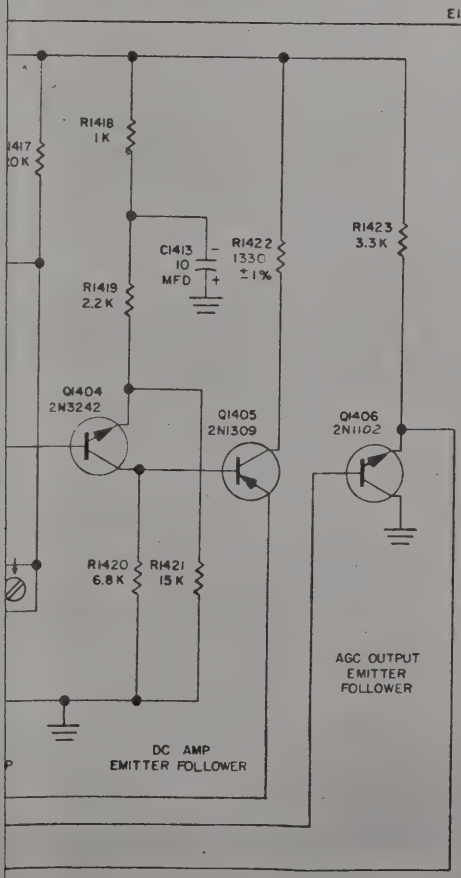


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

   INDICATES SCREWDRIVER ADJUSTMENT
5. LINK CONNECTED GIVES AUDIO RESPONSE DOWN TO 50 C.P.S.

RACAL RA6217
AUDIO AMP.
DWG. NO. G01499C
SERIES 1300

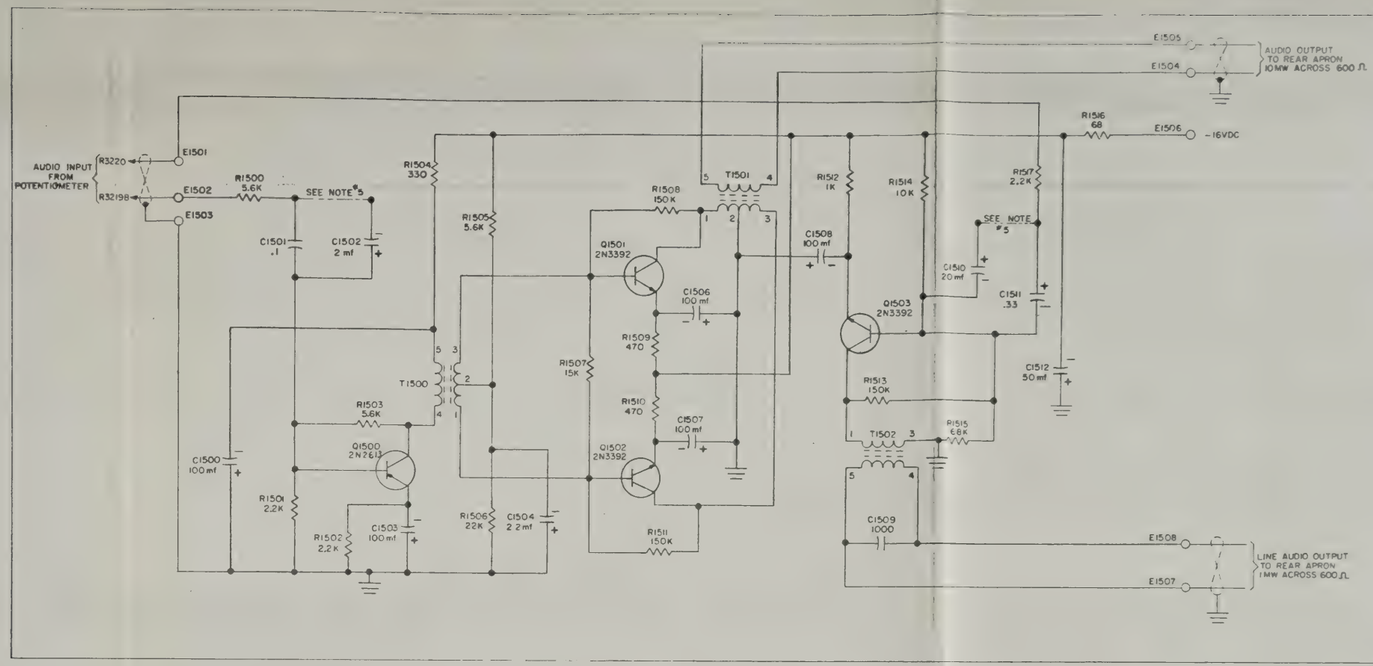


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

   INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
AGC
DWG. NO. G-01500C
SERIES 1400

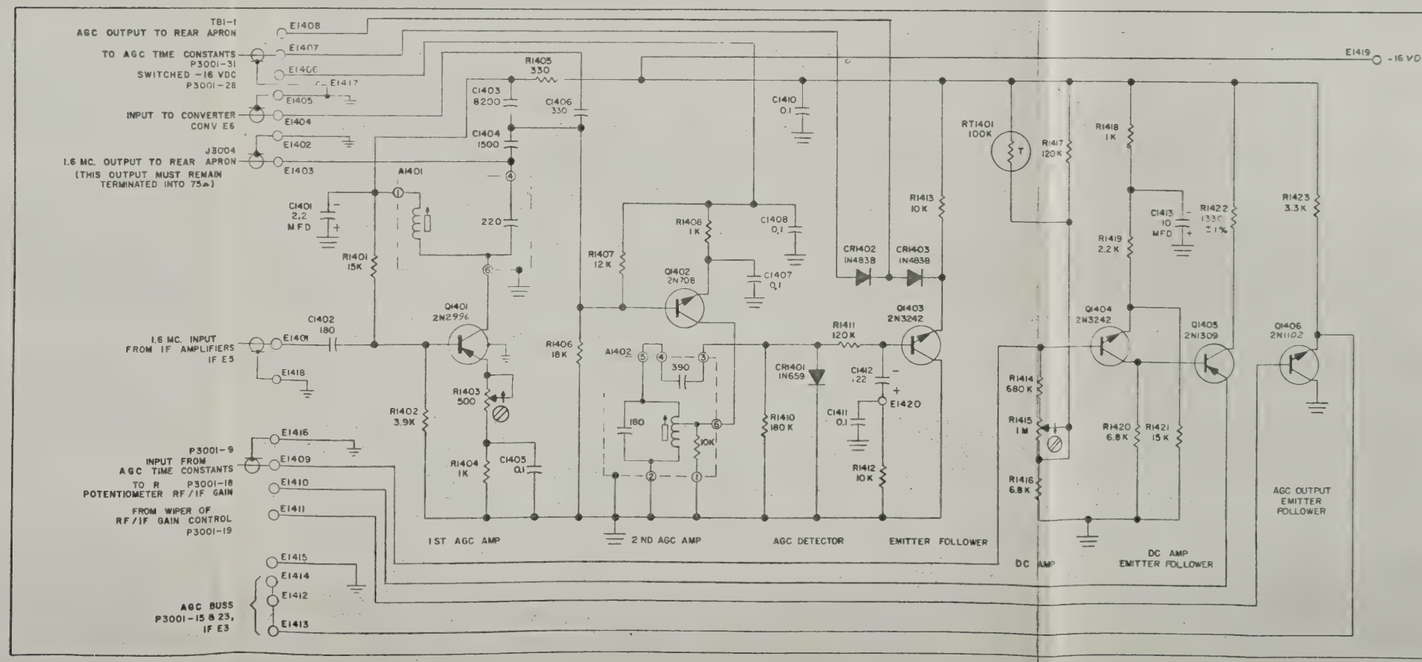


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIMENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

   INDICATES SCREWDRIVER ADJUSTMENT
5. LINK CONNECTED GIVES AUDIO RESPONSE DOWN TO 50 C.P.S.

RACAL RA6217
AUDIO AMP.
DWG. NO. G01499C
SERIES 1500

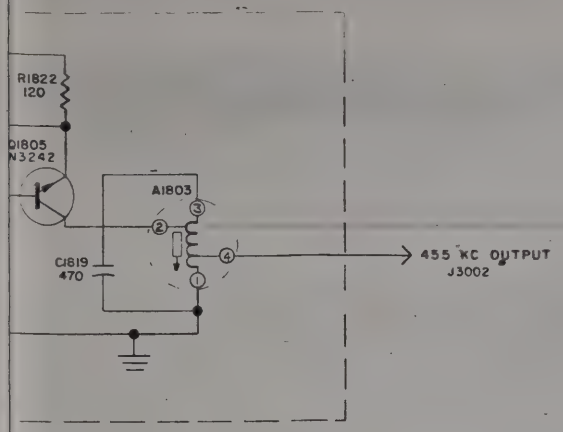


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIMENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

   INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
AGC
DWG. NO. G-01500C
SERIES 1400

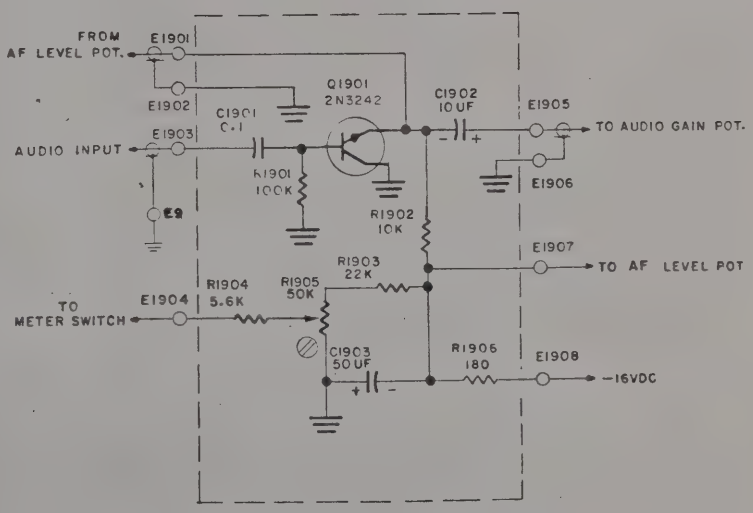


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ± WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
CONVERTER
DWG. NO. G01592C
SERIES 1800

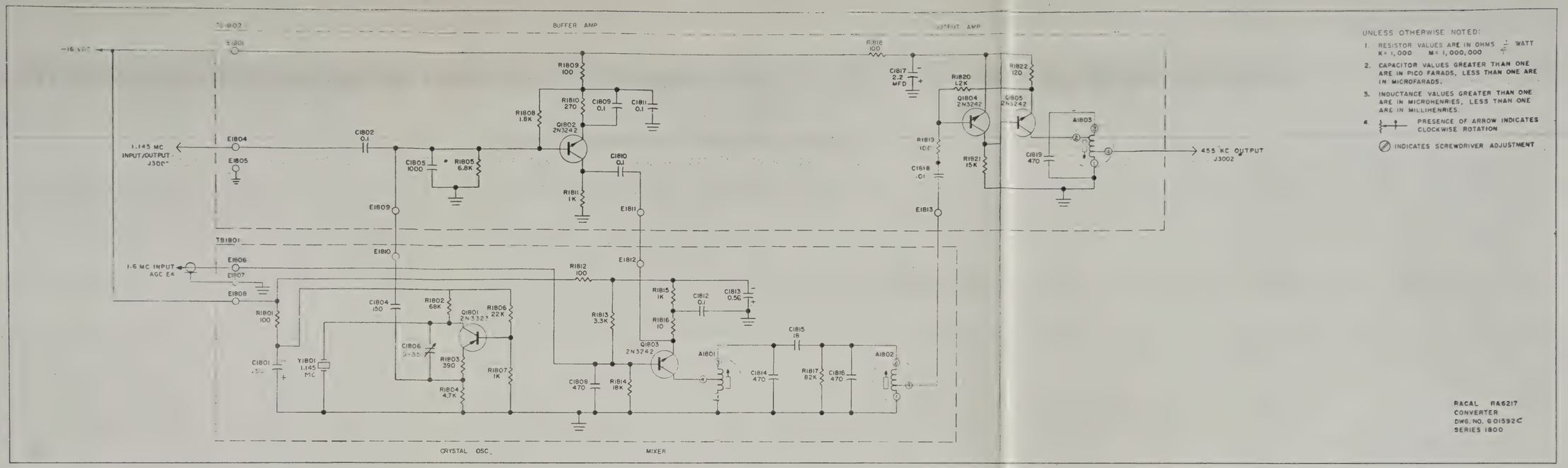


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
EMITTER FOLLOWER
& METER ZERO
DWG. NO. G01758
SERIES 1900

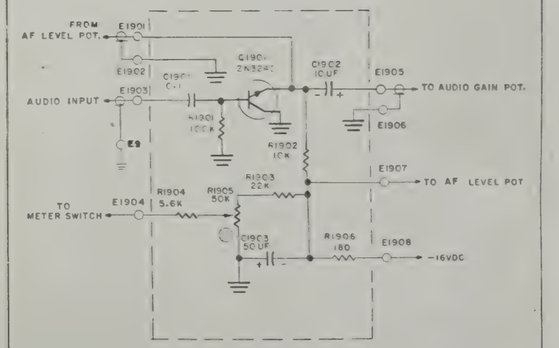


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
CONVERTER
DWG. NO. G01592C
SERIES 1800



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

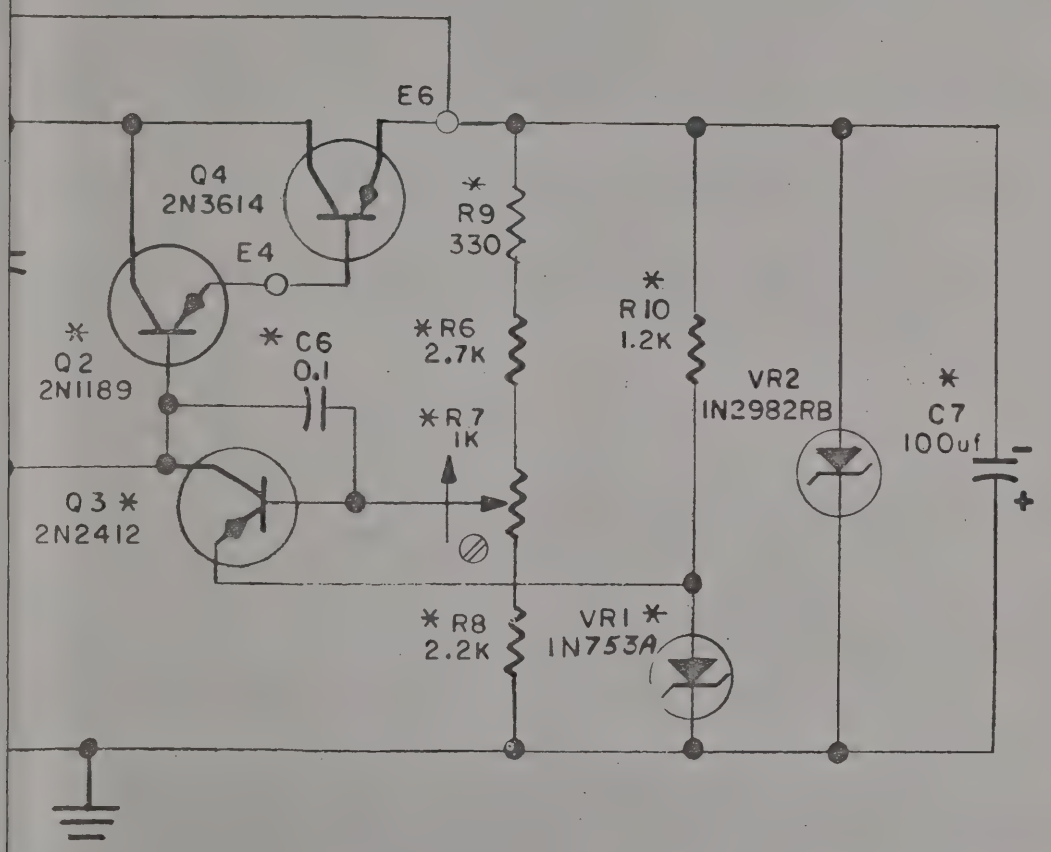
INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
EMITTER FOLLOWER & METER ZERO
DWG. NO. G01758
SERIES 1900

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION FOR INCREASE IN VOLTAGE

   INDICATES SCREWDRIVER ADJUSTMENT

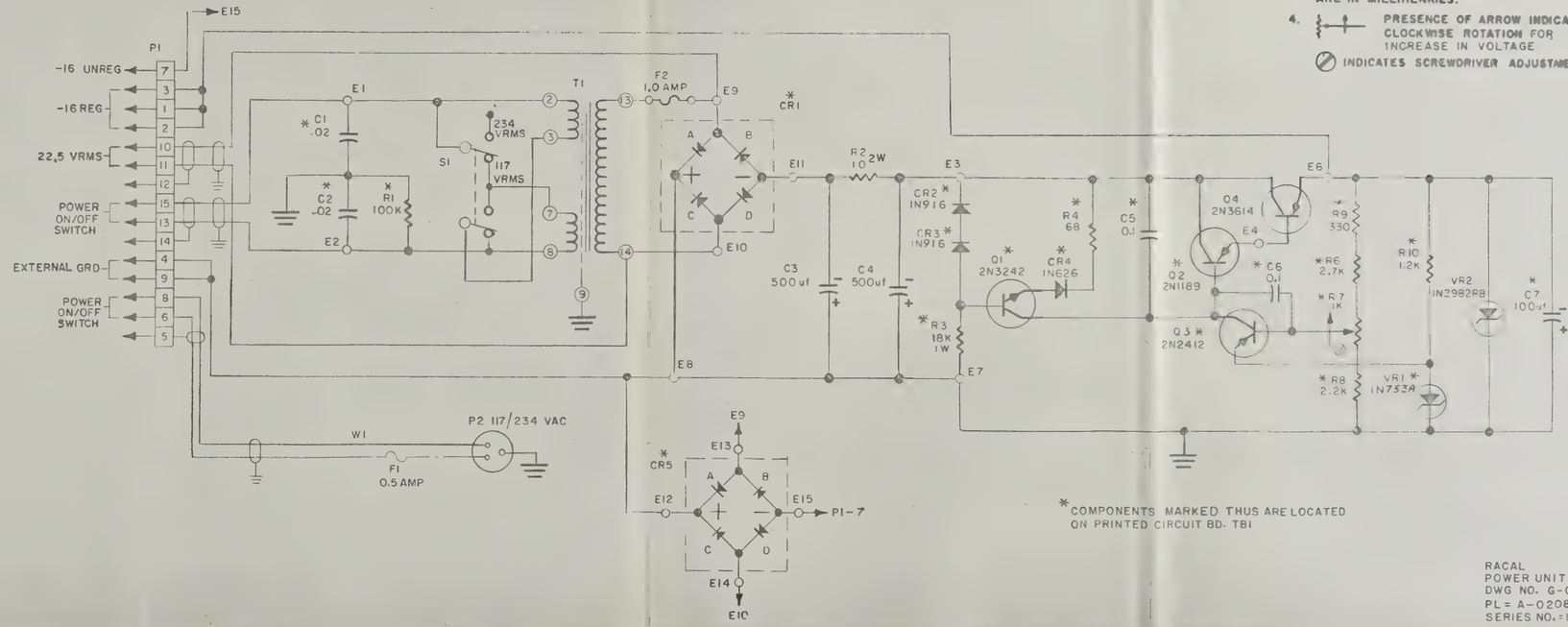


* MARKED THUS ARE LOCATED
CIRCUIT BD. TBI

RACAL
POWER UNIT MA-6302
DWG NO. G-01311
PL = A-02088
SERIES NO. = 1300

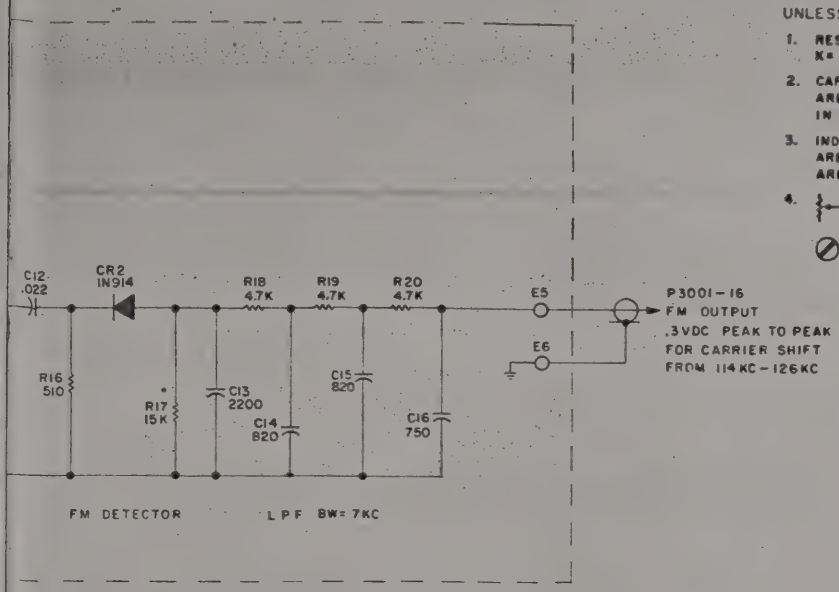
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION FOR INCREASE IN VOLTAGE
   ⊘ INDICATES SCREWDRIVER ADJUSTMENT



*COMPONENTS MARKED THUS ARE LOCATED ON PRINTED CIRCUIT BD. TBI

RACAL
POWER UNIT MA-6302
DWG NO. G-01311
PL = A-02088
SERIES NO. =1300

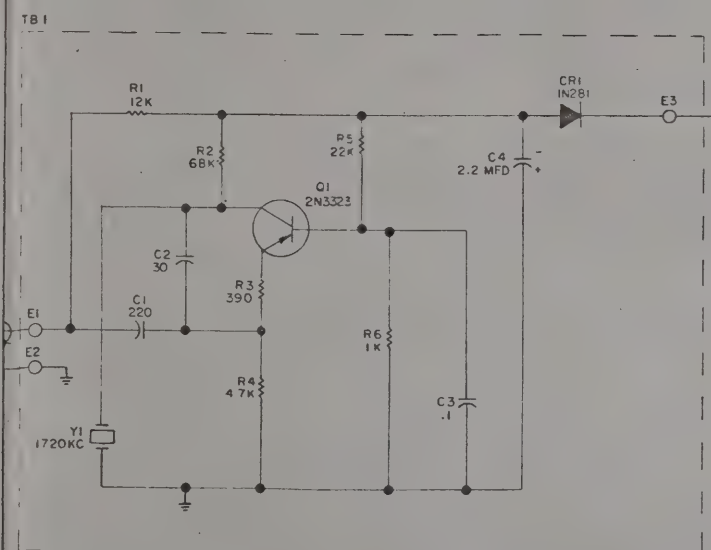


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS WATT
   K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

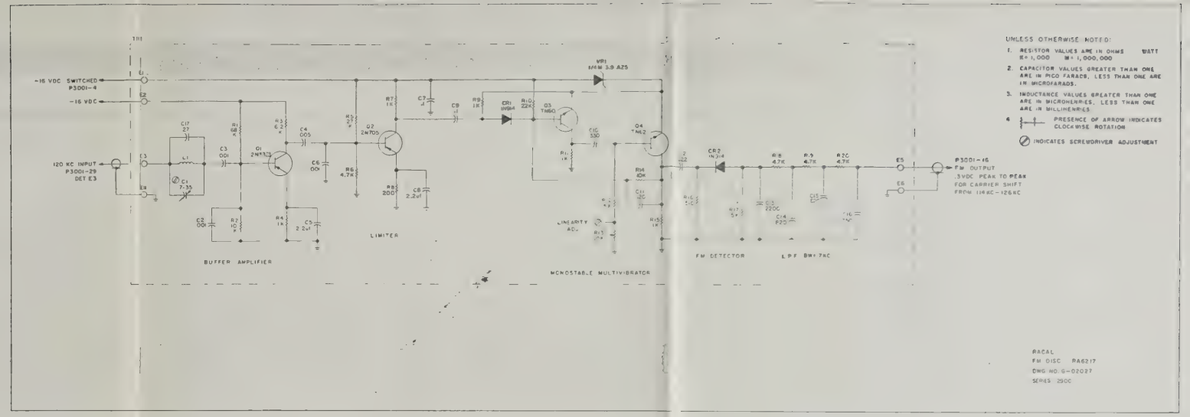
RACAL
FM DISC RA6217
DWG. NO. G-02027
SERIES 2900

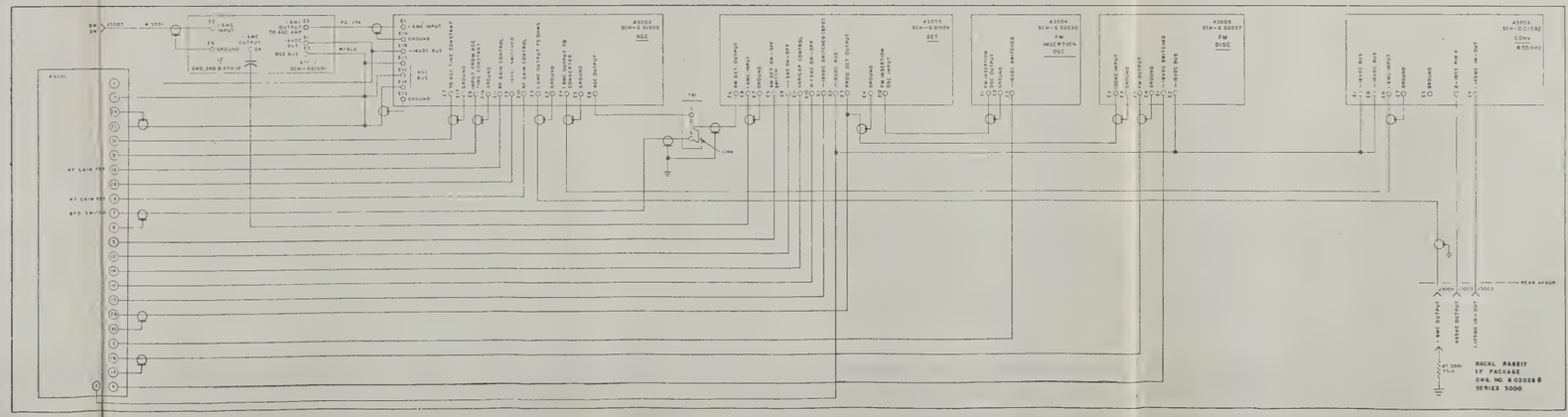


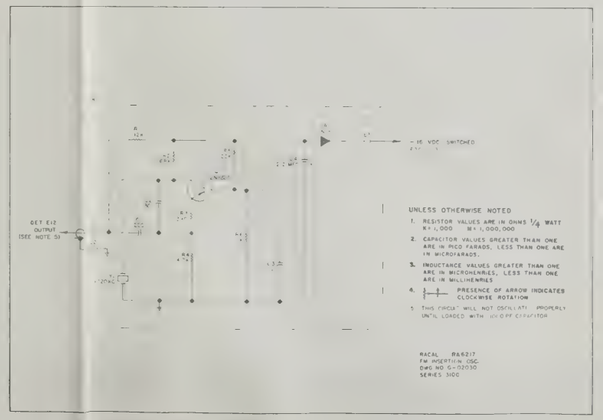
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. THIS CIRCUIT WILL NOT OSCILLATE PROPERLY UNTIL LOADED WITH 1000 PF CAPACITOR

RACAL RA6217
FM INSERTION OSC.
DWG NO. G-02030
SERIES 3100


-15 VDC SWITCHED P3001-4
-15 VDC
120 KC INPUT P3001-29 DET E3
BUFFER AMPLIFIER
LIMITER
MONOSTABLE MULTIVIBRATOR
FM DETECTOR
L.P.F. BW=7KC
P3001-15 FM OUTPUT .5VDC PEAK TO PEAK FOR CARRIER SHIFT FROM 119.2C-126.6C
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN MICROFARADS, LESS THAN ONE ARE IN PICOFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
RACAL
FM DISC RA6217
DWG NO. G-02027
SERIES 2900


A3001
A3002 SCH-G 01500 AGC
A3003 SCH-G 01504 DET
A3004 SCH-G 02030 FM INSERTION OSC
A3005 SCH-G 02027 FM DISC
A3006 SCH-G 01-1592 CONV 4.55 MHz
RACAL RA6817 IF PACKAGE DWG. NO. G 02028 G SERIES 3000

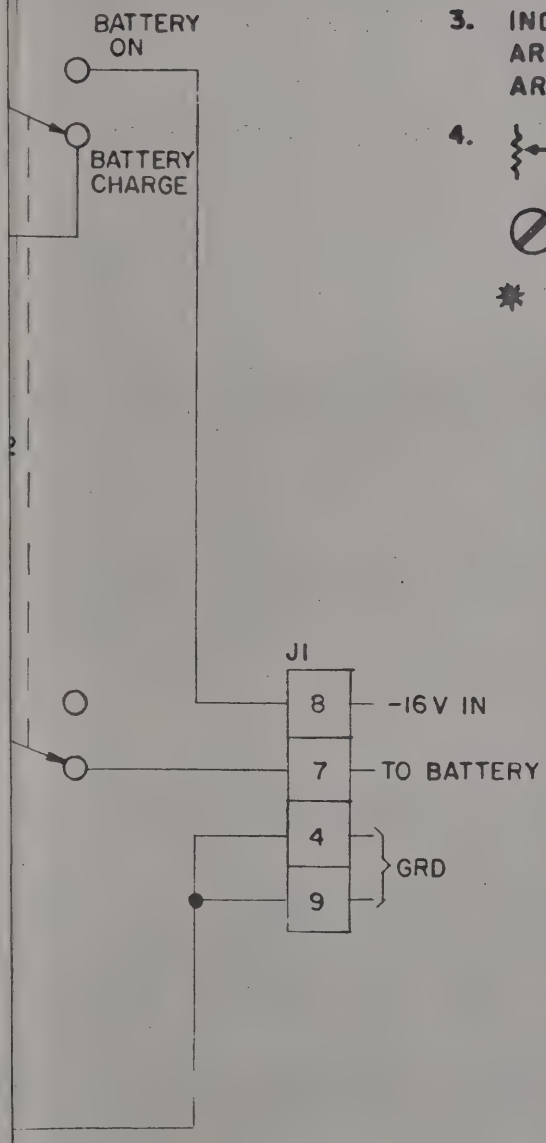

-15 VDC SWITCHED
DET E12 OUTPUT (SEE NOTE 5)
UNLESS OTHERWISE NOTED
1. RESISTOR VALUES ARE IN OHMS 1/8 WATT K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. THIS CIRCUIT WILL NOT OSCILLATE PROPERLY UNTIL LOADED WITH .001 MFD CAPACITOR
RACAL RA6217
FM INSERTION OSC.
DWG NO G-02030
SERIES 3100

UNLESS OTHERWISE NOTED:

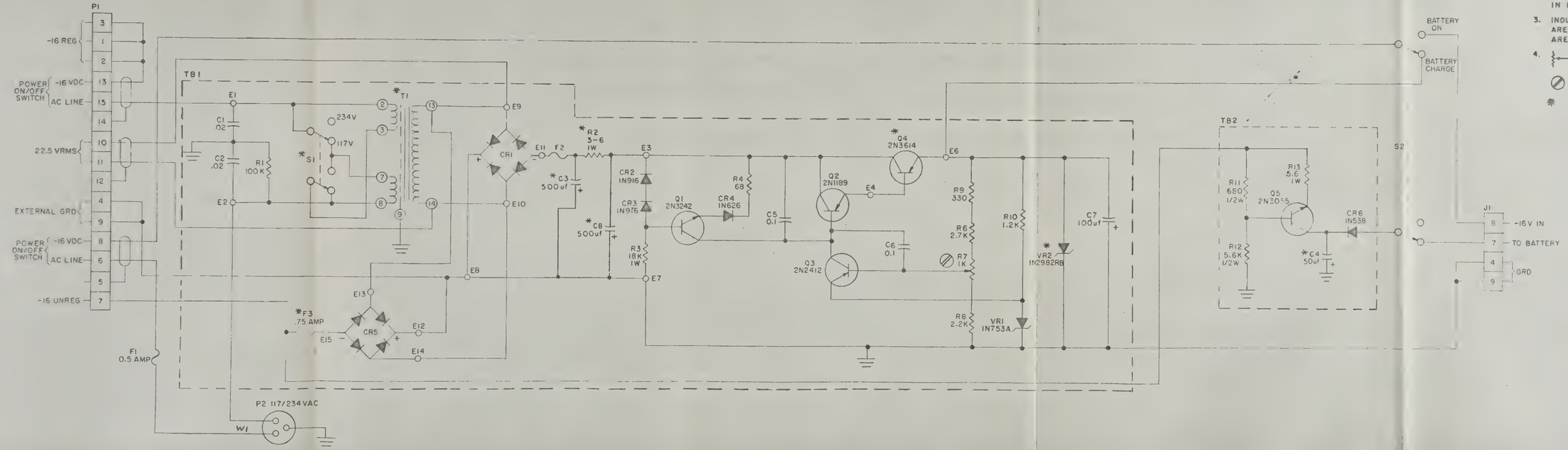
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

✱ INDICATES COMPONENTS NOT MOUNTED ON TB1



RACAL
AC POWER UNIT
/BATTERY CHARGER
DWG G-02535 C
SERIES 100



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

* INDICATES COMPONENTS NOT MOUNTED ON TB1

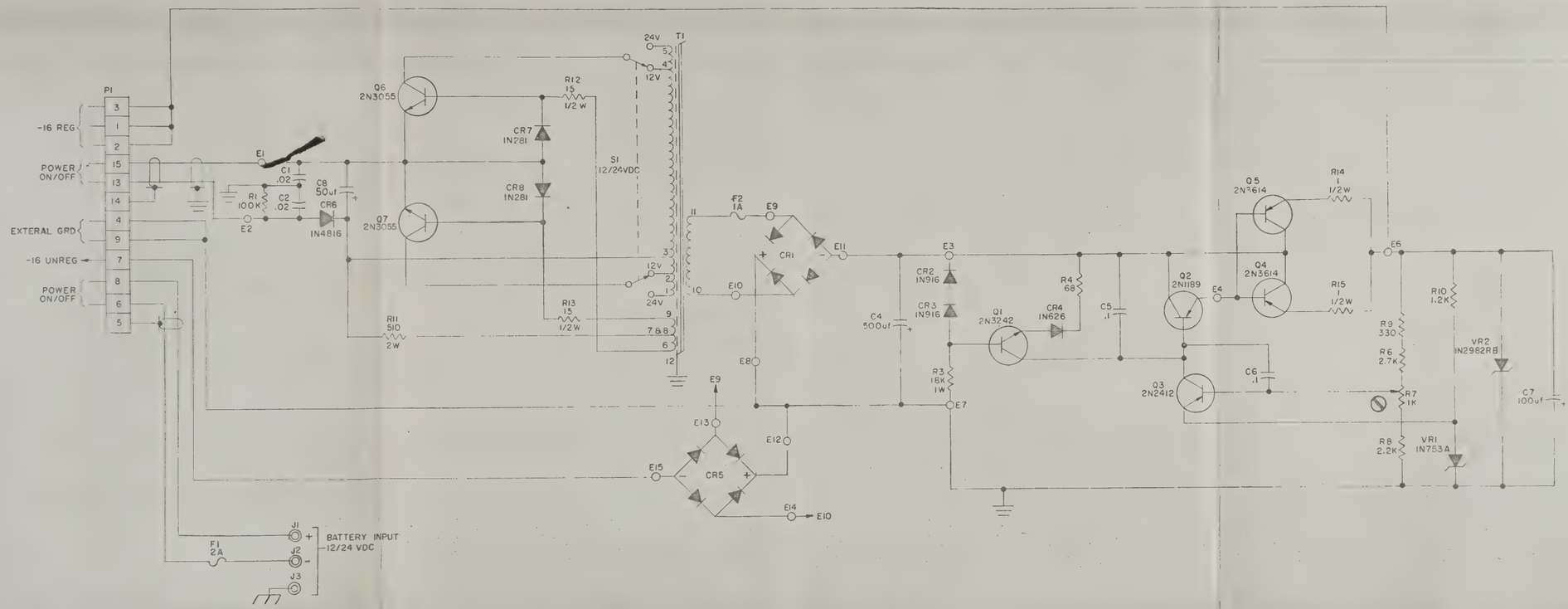
RACAL
AC POWER UNIT
/BATTERY CHARGER
DWG G-02535 C
SERIES 100

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL
DC TO DC CONVERTER
DWG G-02449 C
SERIES 100



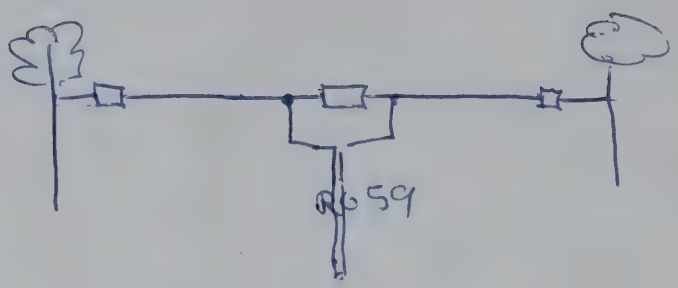
UNLESS OTHERWISE NOTED:

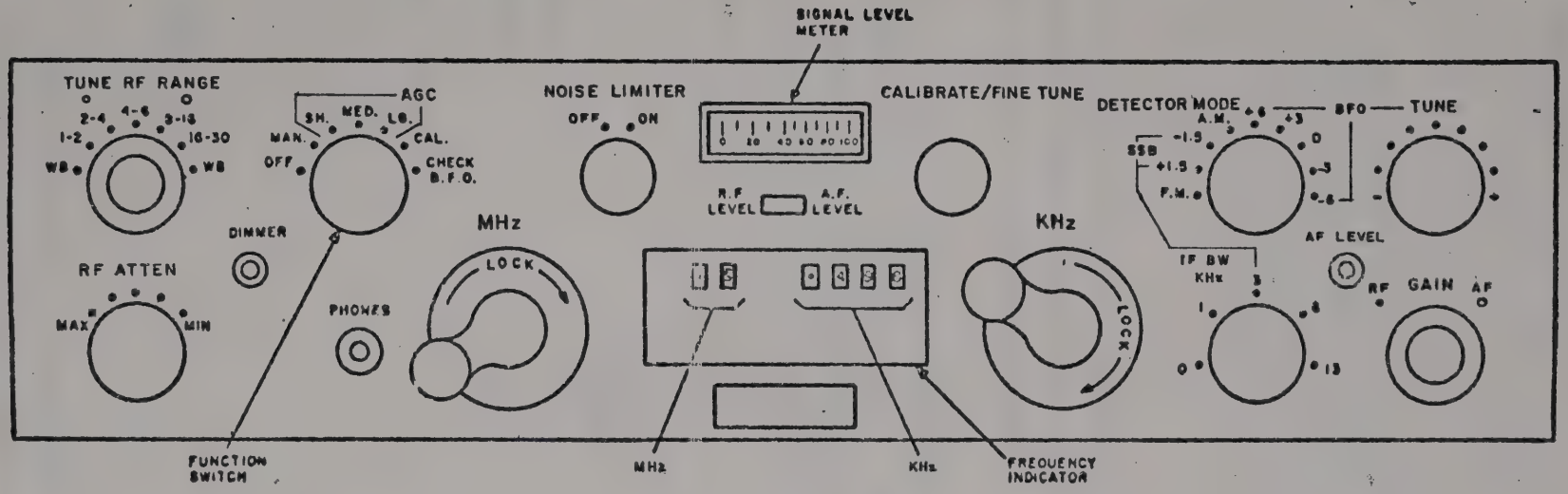
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL
DC TO DC CONVERTER
DWG G-02449 C
SERIES 100

RG 59
Coaxial





RA6217A(IW)S CONTROLS AND INDICATORS

EQUIPMENT DESCRIPTION

1. General

1.1 The RA6217A(1W)S HF Receiver is a standard RA6217A equipment with optional 1 watt AF amplifier and noise limiter modules installed. In addition mechanical modifications have been made to improve the illumination of the frequency dial and signal level meter scale.

1.2 The RA6217A-7(1W)S HF Receiver is a standard RA6217A equipment with optional 1 watt AF amplifier, noise limiter, 100 KHz converter and Wideband Third Mixer modules installed.

A post-detector filter is fitted on the Mode Switch (S2) to prevent residual BFO leakage to the 1.6 MHz wideband IF output. In addition mechanical modifications have been made to improve the illumination of the frequency dial and signal level meter scale.

2. Options Included

	RA6217A-7(1W)S	RA6217A(1W)S
a. 100 KHz IF output	*	
b. 1 watt AF output	*	*
c. BFO filter	*	
d. 1.6 MHz wideband IF output	*	
e. Improved dial illumination	*	*
f. Improved meter illumination	*	*
g. Noise limiter	*	*

3. Specification Changes

3.1 AF Outputs

a. 1 watt to rear terminals into an 8 ohm load.

b. 10 mW to phone jack into a 600 ohm load.

c. 1 mW to rear terminals into a 600 ohm balanced load with independent gain control.

3.2 IF Outputs: (RA6217A-7(1W)S only)

a. 100 KHz: Bandwidth determined by IF filter selected.

b. 1.6 MHz: Bandwidth 75 KHz nominal

4. Relevant Schematics and Parts Lists

a. Schematic Schedule

Assembly	RA6217A-7(1W)S		RA6217A(1W)S	
	Figure No. RA6217A/A3 Manual	RCI DWG.	Figure No. RA6217A/A3 Manual	RCI DWG.
IF Package	7-12 sheet 2	GO3327	7-12 sheet 1	GO2028
Converter (455 KHz)	---	---	7-20	DO3326
Converter (100KHz)	7-21	DO3291	---	---
Audio Amplifier (1 watt)	---	*CO5591	---	*CO5591
Noise Limiter	---	*CO6001	---	*CO6001
Third Mixer (Wideband).	7-10 sheet 2	GO2291	---	---
Third Mixer	---	---	7-10 sheet 1	GO1302
BFO Filter	---	*GO1310	---	---

b. Parts List Schedule

IF Package	6-39	AO2029-2	6-39	AO2029-1
Converter (455 KHz)	---	---	6-46a	AO3325
Converter (100 KHz)	6-46b	AO3323	---	---
Audio Amplifier (1 watt)	--	*AO5590	---	AO5590
Noise Limiter	---	*CO6001	---	CO6001
Third Mixer Wideband	6-26	AO2290	---	---
Third Mixer	---	---	6-26	AO1323-1
BFO Filter	---	*GO1310	---	---

* Schematics and Parts Lists included in this addendum.

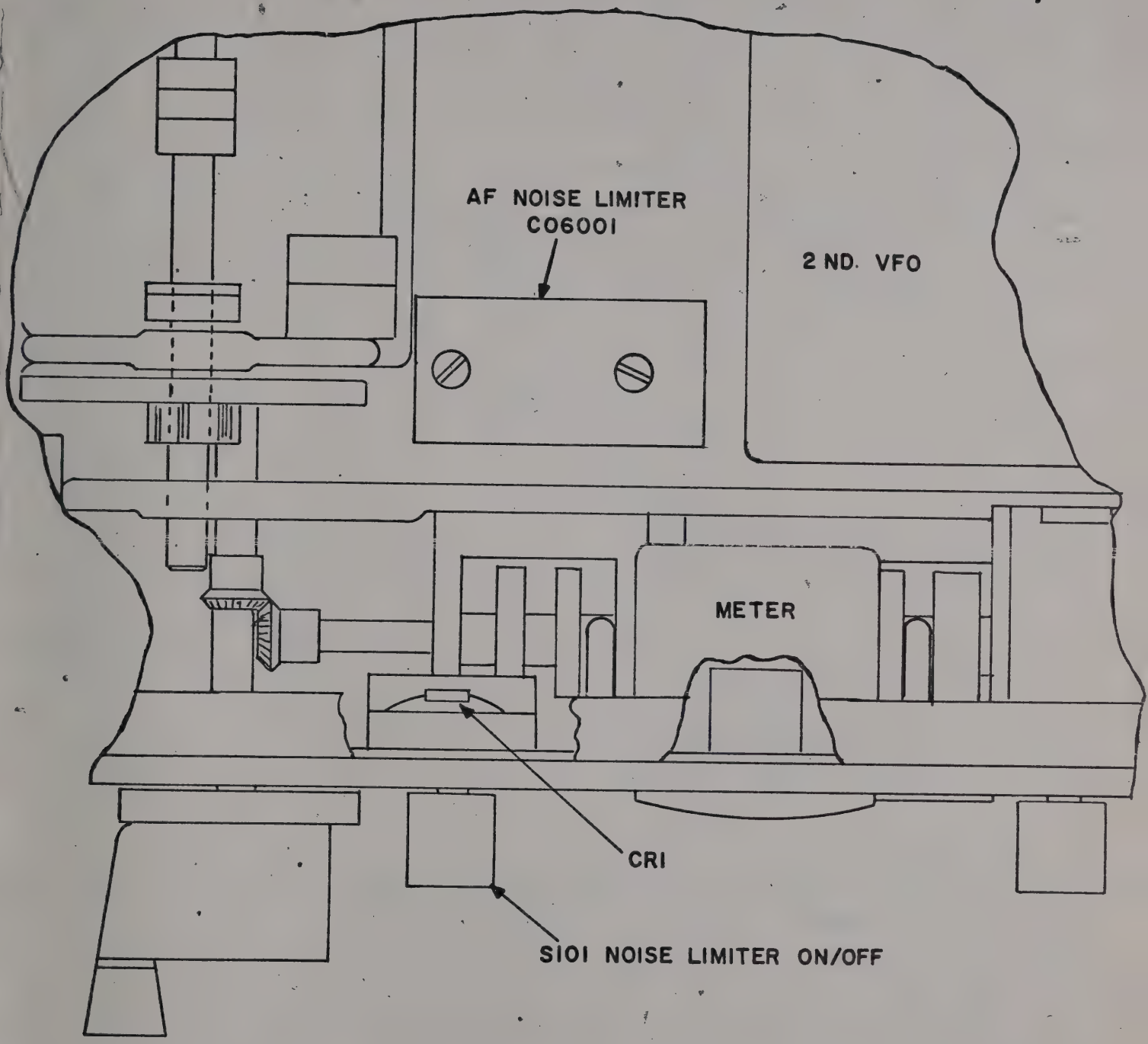
5. Illumination Improvements

a. Improved scale lighting is achieved by fitting a spacer behind the dial bezel and re-positioning the dial lamps.

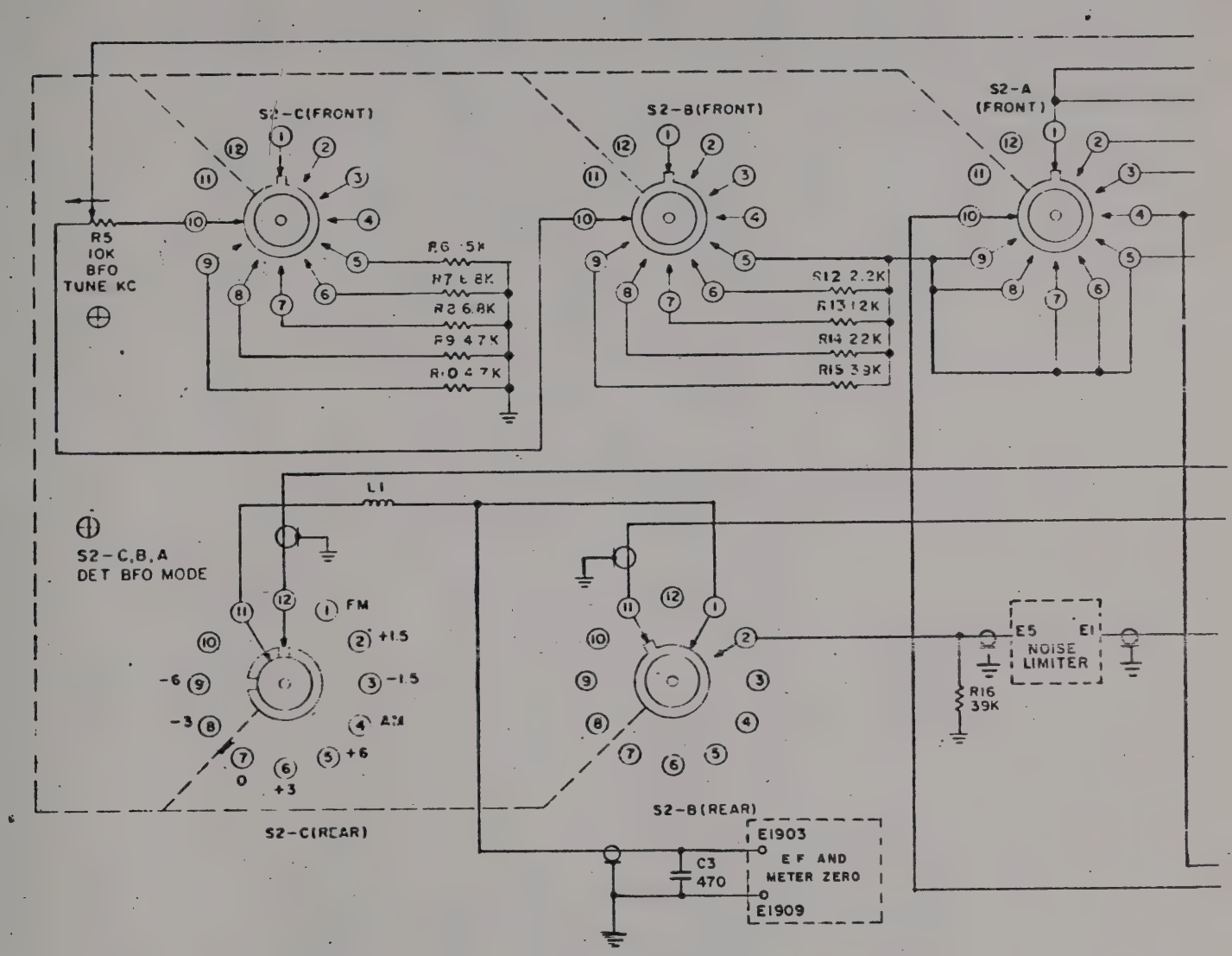
b. Signal level meter M101 RCI Part No. BO2545-1 is replaced with RCL Part No. BD35519 fitted with a translucent scale. A3202 R4 changed from 5.6K to 3.9K Part No. RCI 10677.

6. Noise Limiter

A noise limiter operating to reject ignition noise in the AM reception mode is fitted between J1 pin 7 and S2-B (Rear) contact 2. R17, 8.2K is deleted. S101 previously used as 2nd VFO internal/external switch is now used as noise limiter on/off control. Front panel marking is changed accordingly.

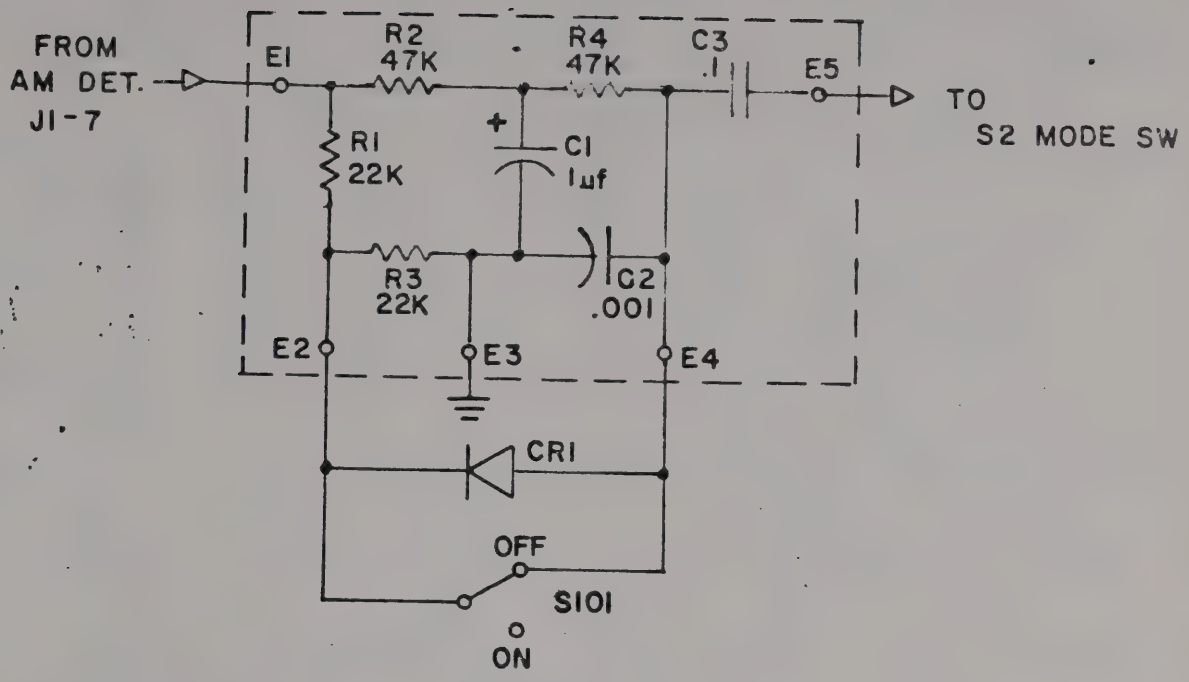


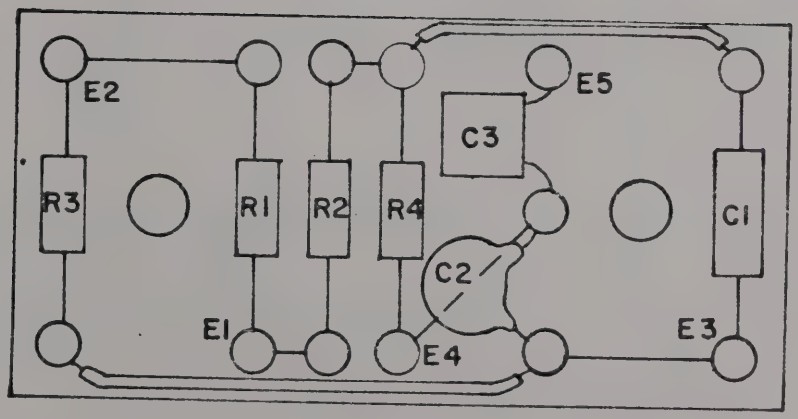
NOISE LIMITER PHYSICAL LOCATION



LOCATION BFO FILTER / NOISE LIMITER

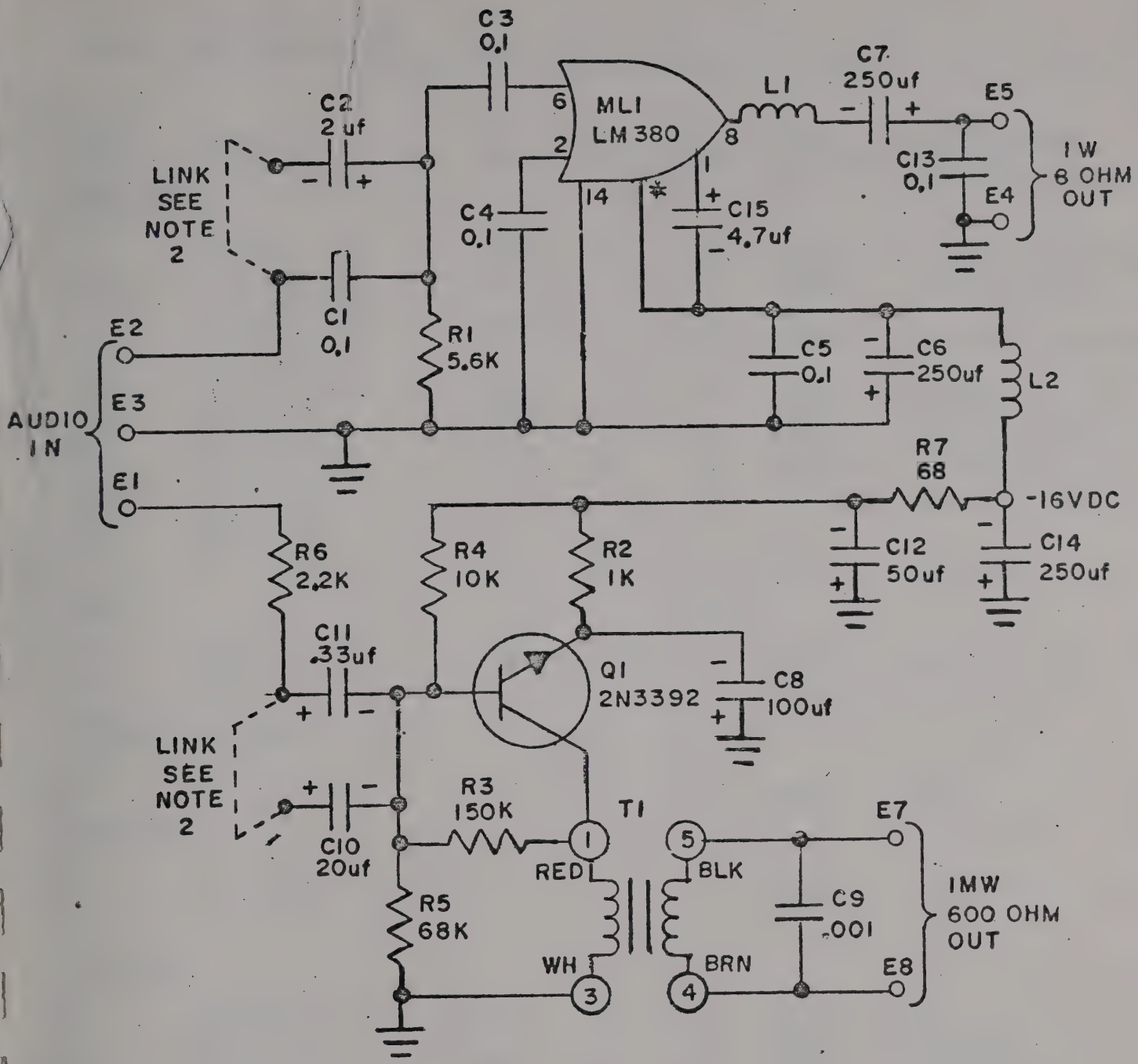
PART OF G01310 (FIG 7-1 SHEET 1)





A.F. NOISE LIMITER

C06001



NOTES:

1. * PINS 3,4,5,7,10,11,12 CONNECTED TO COPPER AREA FOR HEAT SINK.
2. LINK CONNECTED GIVES AUDIO RESPONSE DOWN TO 50 Hz.

1 WATT
AUDIO AMPL. BD.
C05591C

RA6217 AUDIO AMPLIFIER BOARD - SCH. C05591 - Parts List A05590

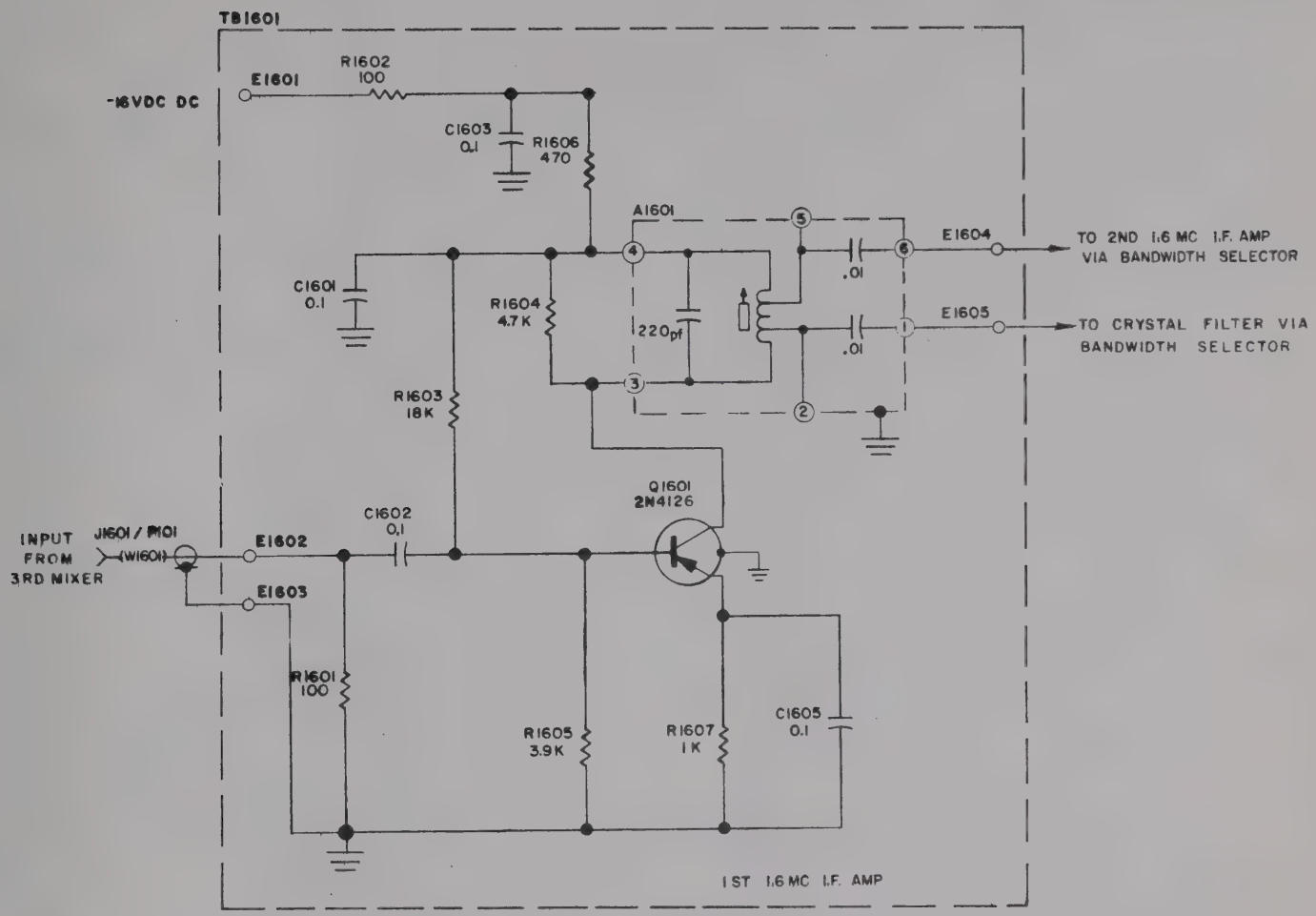
Ckt. Ref.	Description	Value	Tol. %	Rating	RCI Part No.	Manufacturers Part No.
CAPACITORS						
C1	Ceramic	0.1uf	20	50	21732	Erie 8131050651104M
C2	Electrolytic	2uf		12	24008	Sprague TE1121
C3 thru C5	Same as C1					
C6	Electrolytic	250uf		25	24043	Amperex C437AR/F250
C7	Same as C6					
C8	Electrolytic	100uf		15	24007	TE1162
C9	Ceramic	1000pf			21703	Centralab DD102G
C10	Electrolytic	20uf		6	24006	Sprague TE1090
C11	Electrolytic	.33uf	10	35	25016	Kemet KR33J35KS
C12	Electrolytic	50uf		25	24005	Sprague TE1209
C13	Same as C1					
C14	Same as C6					
C15	Electrolytic	4.7uf	20	35	25017	Kemet K4R7E35
CHOKE						
L1	Choke	15uH			43017	Miller 9310-40
L2	Choke				D-05612	
INTEGRATED CIRCUIT						
ML1					36517	LM380
TRANSISTOR						
Q1	Transistor				31250	2N3392
RESISTORS						
R1	Fixed Comp.	5.6K	5	1/4	10681	RC07GF562J
R2	Fixed Comp.	1K	5	1/4	10663	RC07GF102J
R3	Fixed Comp.	150K	5	1/4	10715	RC07GF154J
R4	Fixed Comp.	10K	5	1/4	10687	RC07GF103J
R5	Fixed Comp.	68K	5	1/4	10707	RC07GF683J
R6	Fixed Comp.	2.2K	5	1/4	10671	RC07GF222J
R7	Fixed Comp.	68	5	1/4	10635	RC07GF680J
TRANSFORMERS						
T1					D-02907	

RA6217 BFO FILTER - SCH. 901310

Ckt. Ref.	Description	Value	Tol. %	Rating	RCI Part No.	Manufacturers Part No.
CAPACITORS						
C3	Mica	470pf	5		22040	CM06
CHOKE						
L1	Choke	1mH	10		43020	Miller 9310-12

RA6217 AF NOISE LIMITER - SCH. C06001

CAPACITORS						
C1	Electrolytic	1uf			24030	Sprague TE1200
C2	Ceramic	.001uf			21712	Centralab DD-102
C3	Ceramic	0.1uf	20		21732	Erie 8131-050-651-104M
RESISTORS						
R1	Fixed Comp.	22K	5	¼W	10695	RC07
R2	Fixed Comp.	47K	5	¼W	10703	RC07
R3	Same as R1					
R4	Same as R2					
DIODE						
CR1	Germanium				35511	IN965A

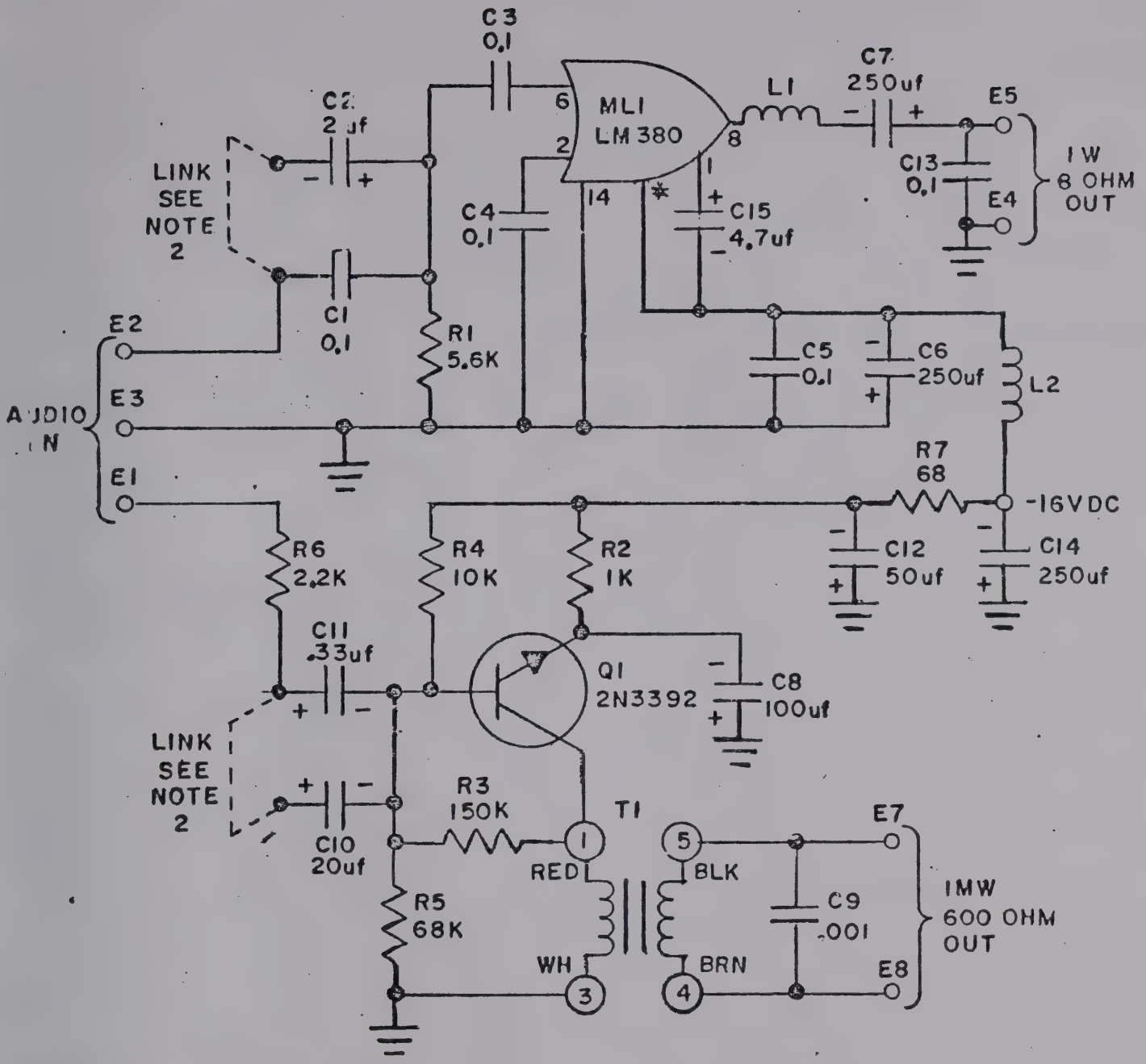


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS WATT
   K=1,000 M=1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARAD.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. INDICATES SCREWDRIVER ADJUSTMENT

1st IF

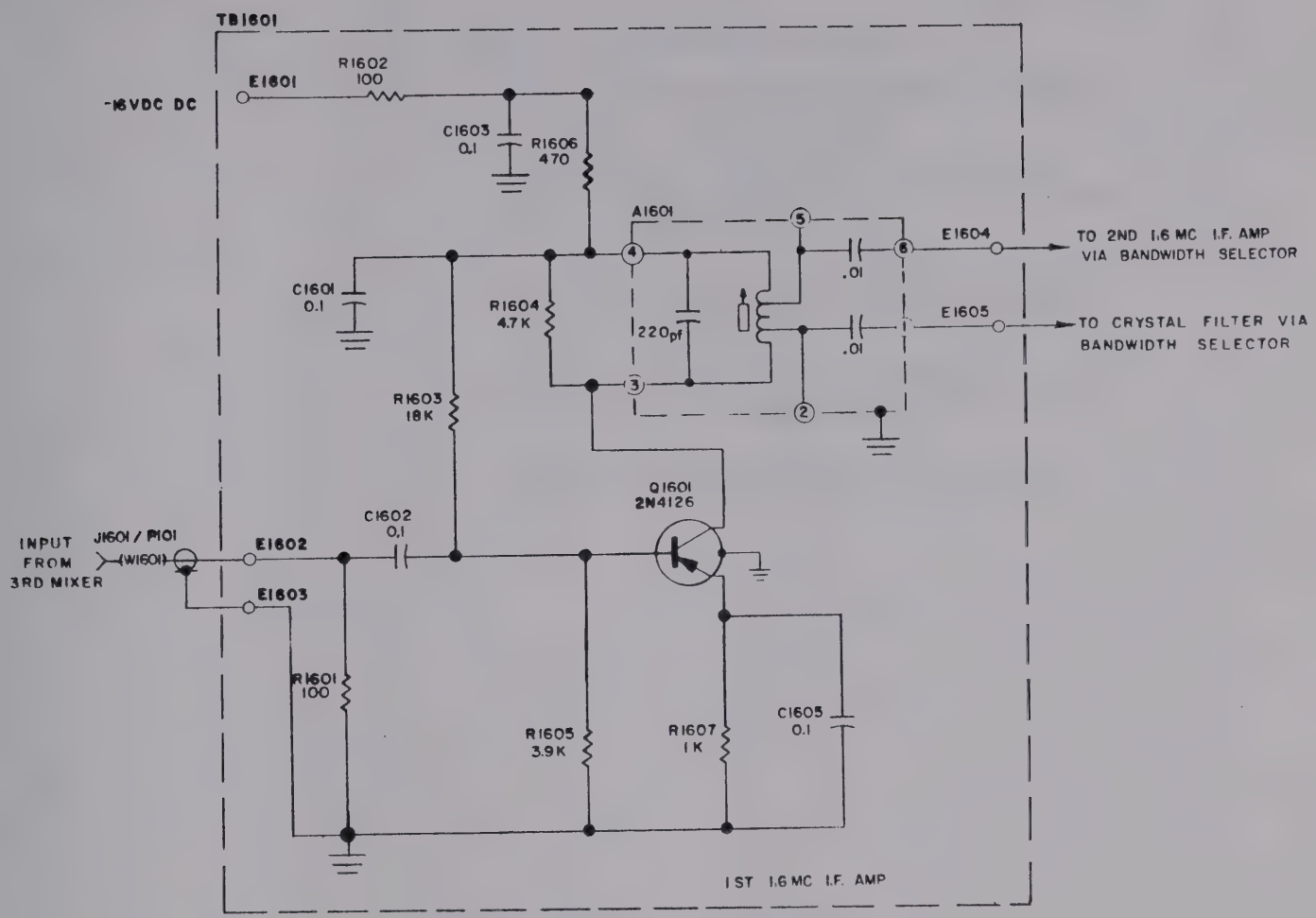
FIG 7-11



NOTES:

1. * PINS 3,4,5,7,10,11,12 CONNECTED TO COPPER AREA FOR HEAT SINK.
2. LINK CONNECTED GIVES AUDIO RESPONSE DOWN TO 50 Hz.

1 WATT
AUDIO AMPL. BD.
C05591C



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4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. INDICATES SCREWDRIVER ADJUSTMENT

1st IF

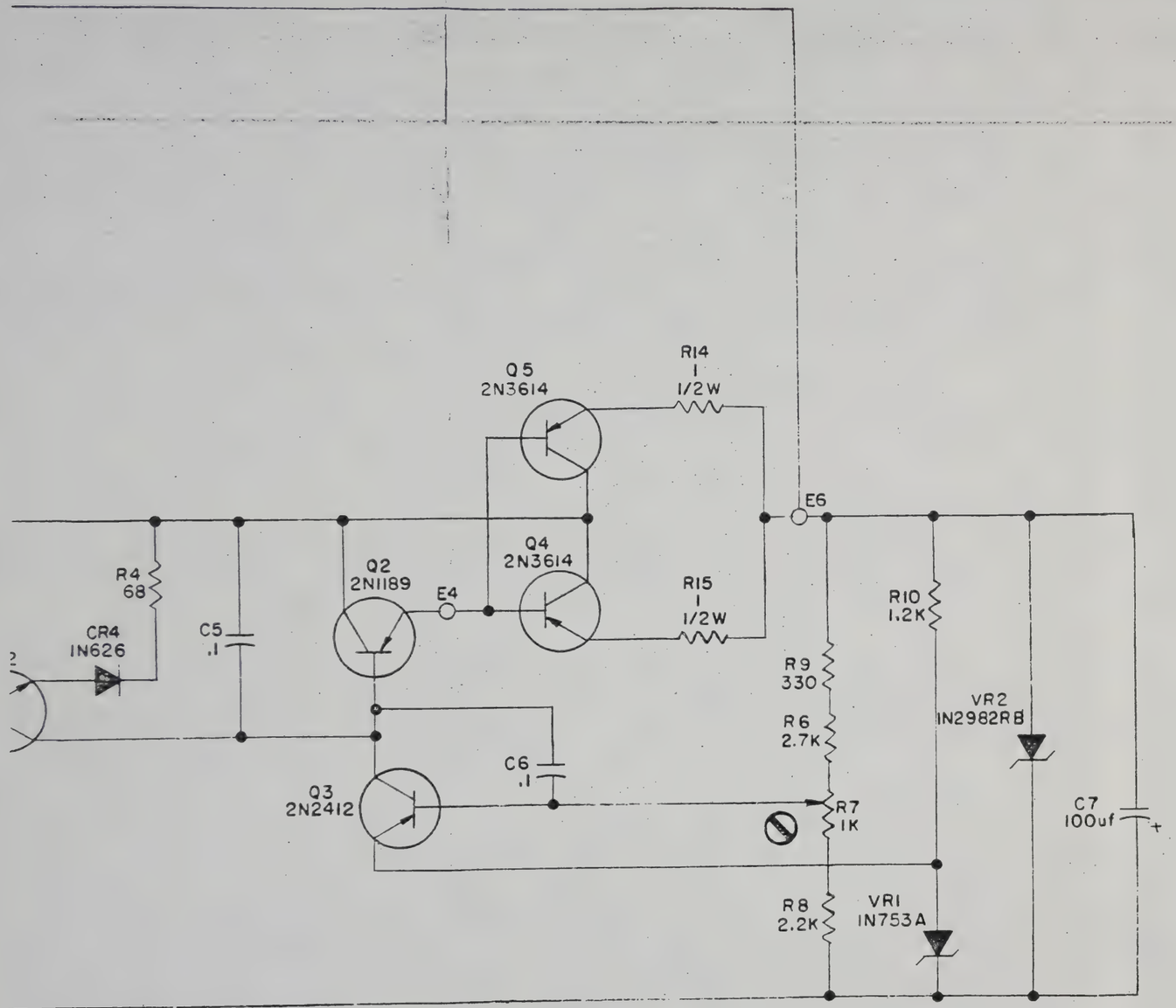
FIG 7-11

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

   INDICATES SCREWDRIVER ADJUSTMENT

RACAL
DC TO DC CONVERTER
DWG G-02449 C
SERIES 100



UNLESS OTHERWISE NOTED:

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3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

⊘ INDICATES SCREWDRIVER ADJUSTMENT

RACAL
DC TO DC CONVERTER
DWG G-02449 C
SERIES 100

P1
3
1
2
15
13
14
4
9
7
8
6
5
-16 REG
POWER ON/OFF
EXTERAL GRD
-16 UNREG
POWER ON/OFF
E1
E2
C1 .02
C2 .02
R1 100K
C8 50uf
CR6 IN4816
Q6 2N3055
Q7 2N3055
R11 510 2W
R12 15 1/2 W
R13 15 1/2W
CR7 IN281
CR8 IN281
S1 12/24VDC
24V
12V
12V
24V
T1
5
4
3
2
1
9
7&8
6
12
11
10
F2 1A
E9
E10
E11
CR1
E3
CR2 IN916
CR3 IN916
C4 500uf
Q1 2N3242
E8
R3 18K 1W
E7
E13
E12
E15
CR5
E14
E10
J1
J2
J3
F1 2A
BATTERY INPUT 12/24 VDC

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

* INDICATES COMPONENTS NOT MOUNTED ON TB1

BATTERY ON

BATTERY CHARGE

TB2

S2

*Q4 2N3614

E6

Q2 2N1189

E4

R9 330

R6 2.7K

C6 0.1

R7 1K

R8 2.2K

VR1 IN753A

R10 1.2K

*VR2 IN2982RB

C7 100uf +

R11 680 1/2W

R12 5.6K 1/2W

Q5 2N3055

R13 5.6 1W

CR6 IN538

*C4 50uf +

J1

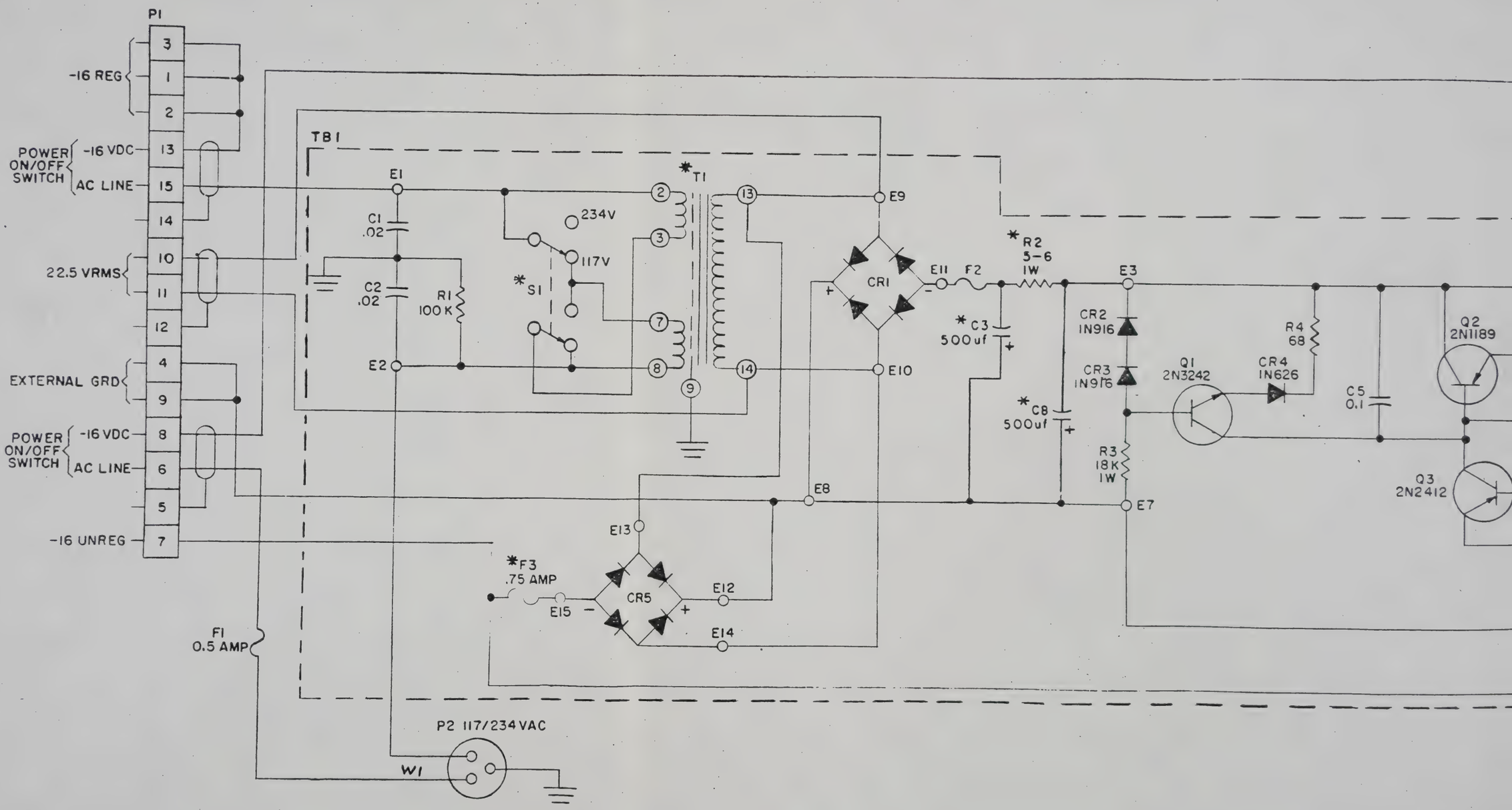
8 -16V IN

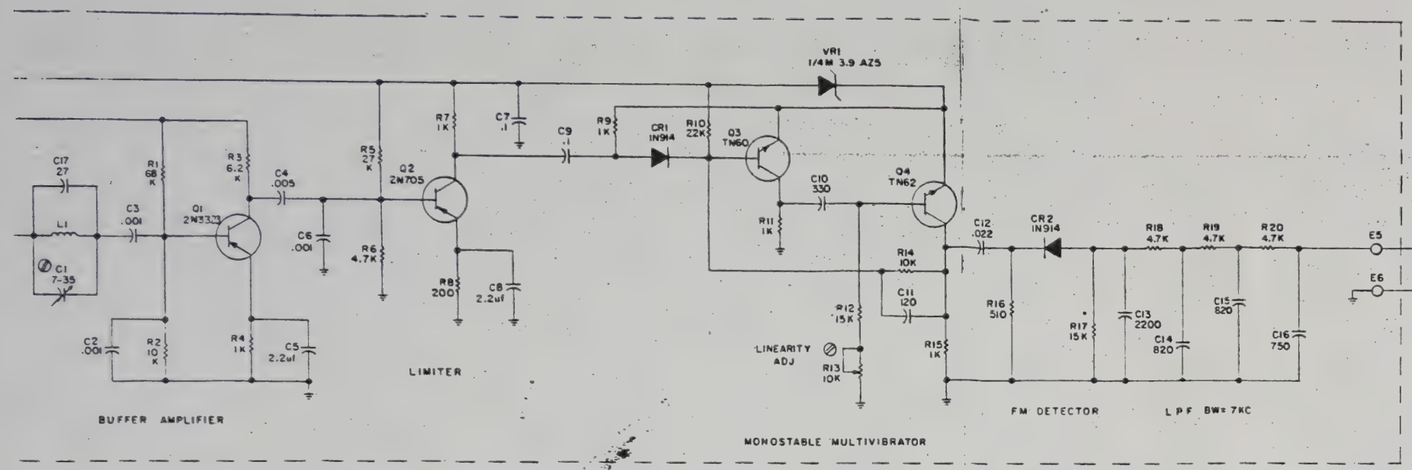
7 TO BATTERY

4 GRD

9

RACAL
AC POWER UNIT
/BATTERY CHARGER
DWG G-02535 C
SERIES 100


P1
3
1
2
-16 REG
POWER ON/OFF SWITCH
-16 VDC
AC LINE
13
15
14
10
22.5 VRMS
11
12
4
EXTERNAL GRD
9
8
POWER ON/OFF SWITCH
-16 VDC
AC LINE
6
5
7
-16 UNREG
TB1
E1
C1 .02
C2 .02
R1 100K
E2
*S1
234V
117V
*T1
2
3
7
8
9
13
14
E9
E10
E8
E13
E12
E14
E15
CR1
E11
F2
*R2 5-6 1W
*C3 500uf
*C8 500uf
E3
CR2 IN916
CR3 IN916
Q1 2N3242
R3 18K 1W
E7
R4 68
CR4 IN626
C5 0.1
Q2 2N1189
Q3 2N2412
*F3 .75 AMP
CR5
F1 0.5 AMP
P2 117/234 VAC
W1

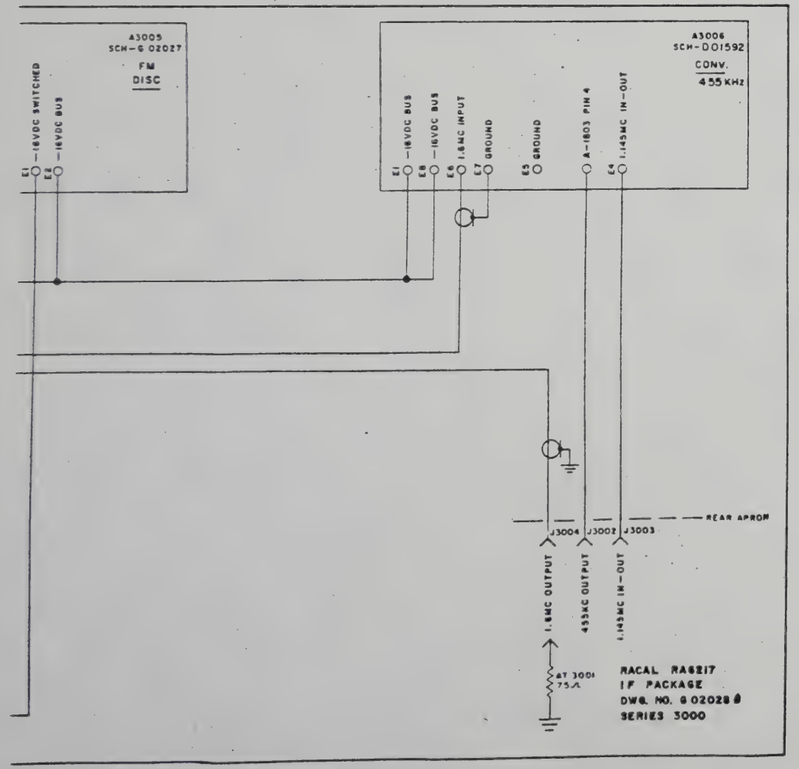


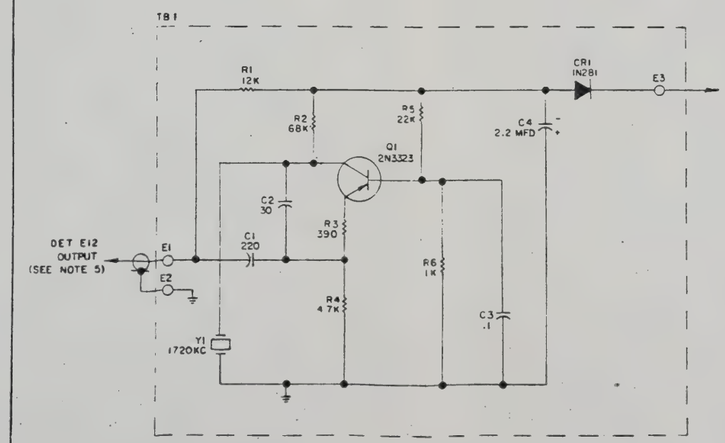
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS WATT
   K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL
FM DISC RA6217
DWG. NO. G-02027
SERIES 2900



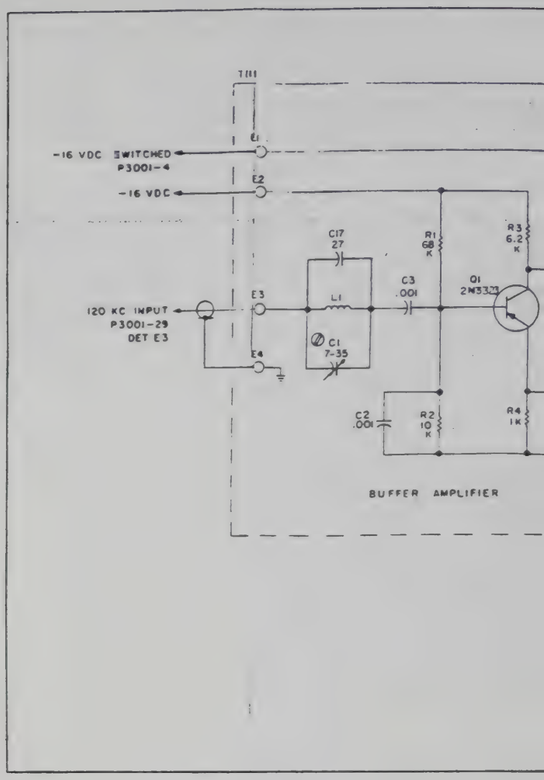


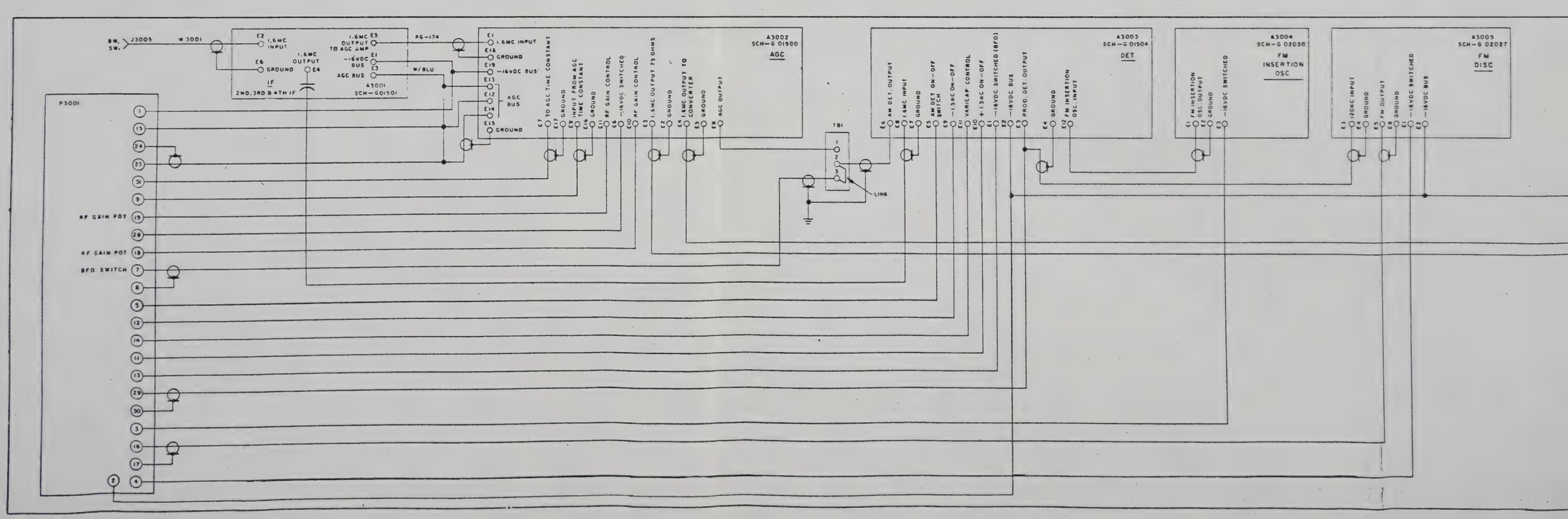
-16 VDC SWITCHED
P3001-3

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. THIS CIRCUIT WILL NOT OSCILLATE PROPERLY UNTIL LOADED WITH 1000 PF CAPACITOR

RACAL RA6217
FM INSERTION OSC.
DWG NO. G-02030
SERIES 3100

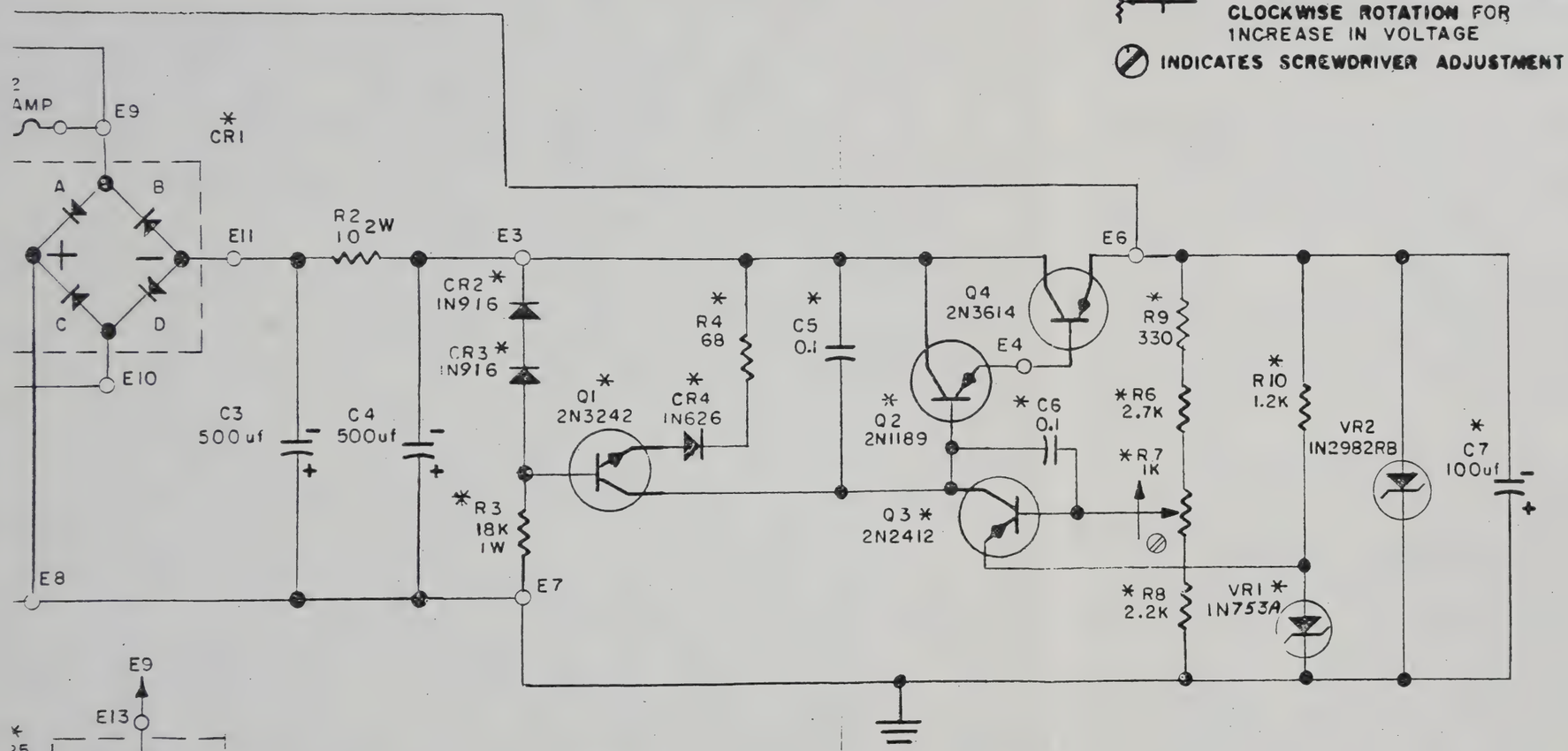

T111
E1
-16 VDC SWITCHED
P3001-4
E2
-16 VDC
C17
27
R1
68
K
R3
6.2
K
C3
.001
Q1
2N3323
E3
L1
120 KC INPUT
P3001-29
DET E3
C1
7-35
E4
C2
.001
R2
10
K
R4
1K
BUFFER AMPLIFIER

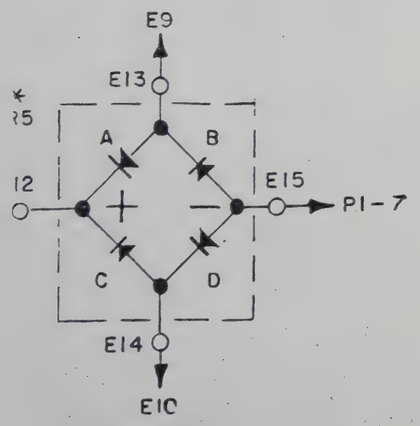

BW SW
J3005
W 3001
E2 1.6MC INPUT
E6 GROUND
1.6MC OUTPUT
E4
IF
2ND, 3RD & 4TH IF
1.6MC E3 OUTPUT TO AGC AMP
-16VDC BUS E1
AGC BUS E3
A3001
SCH-G01501
RG-174
W/BLU
E1 1.6MC INPUT
E16 GROUND
E19 -16VDC BUS
E13
E12
E14
E15 GROUND
AGC BUS
A3002
SCH-G 01500
AGC
E7 TO AGC TIME CONSTANT
E17 GROUND
E18 INPUT FROM AGC TIME CONSTANT
E16 GROUND
E5 RF GAIN CONTROL
E6 -16VDC SWITCHED
E10 RF GAIN CONTROL
E1 1.6MC OUTPUT 75 OHMS
E2 GROUND
E4 1.6MC OUTPUT TO CONVERTER
E3 GROUND
E11 AGC OUTPUT
T81
LINK
A3003
SCH-G 01504
DET
E6 AM DET. OUTPUT
E5
E8 1.6MC INPUT
E7 GROUND
E3 AM DET ON-OFF SWITCH
E9
E1 +1.5VDC ON-OFF
E10 VARICAP CONTROL
E11 +1.5VDC ON-OFF
E12 -16VDC SWITCHED (BFO)
E2 -16VDC BUS
E13 PROD. DET. OUTPUT
E4 GROUND
E17
E14 FM INSERTION OSC. INPUT
A3004
SCH-G 02038
FM INSERTION OSC
E1 FM INSERTION OSC. OUTPUT
E2 GROUND
E3 -16VDC SWITCHED
A3005
SCH-G 02037
FM DISC
E3 120KC INPUT
E4 GROUND
E5 FM OUTPUT
E6 GROUND
E1 -16VDC SWITCHED
E2 -16VDC BUS
P3001
1
15
24
23
34
9
RF GAIN POT 19
28
RF GAIN POT 18
BFO SWITCH 7
8
5
12
14
11
13
29
30
3
16
17
2
4

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION FOR INCREASE IN VOLTAGE

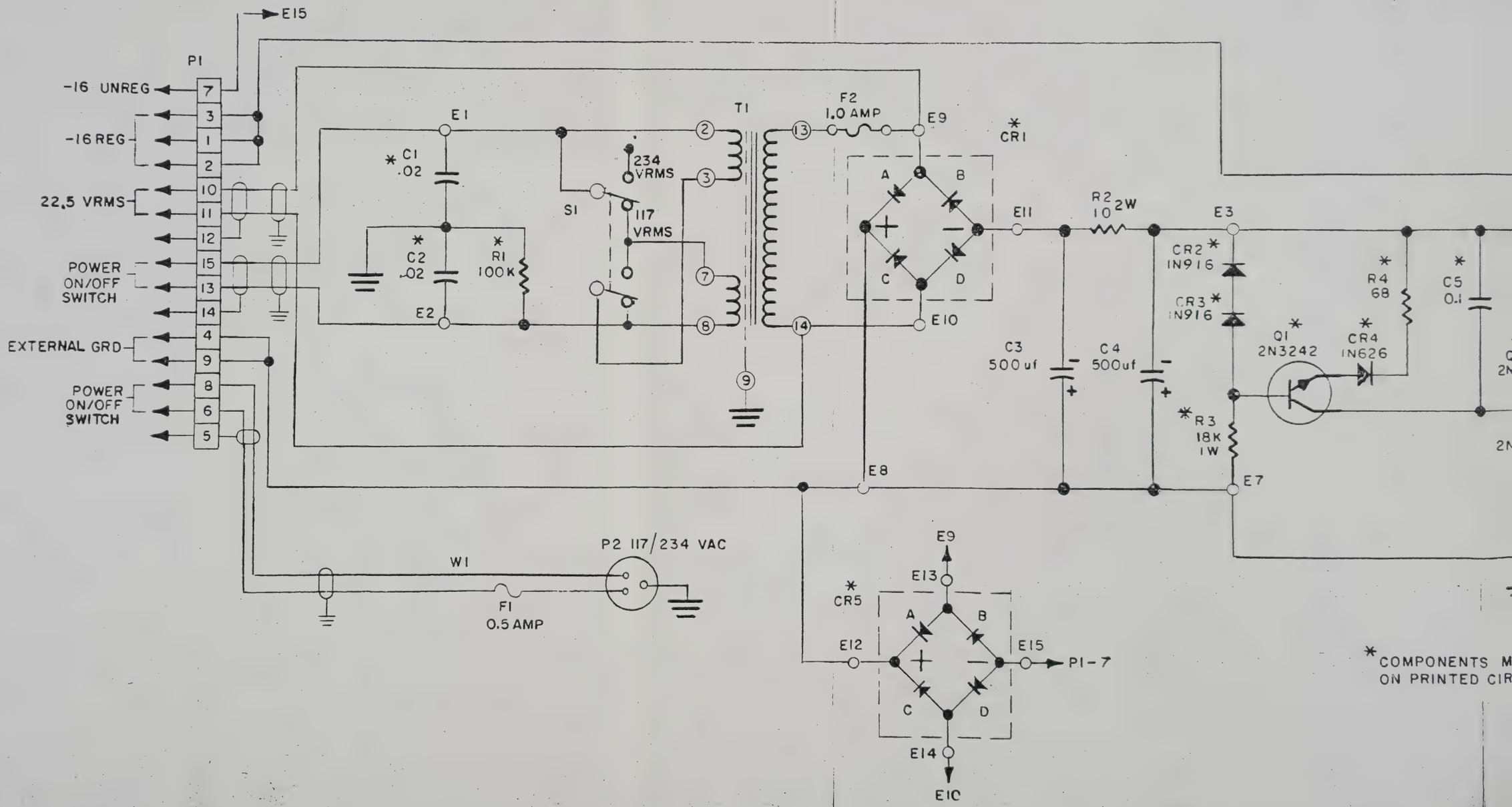
⊘ INDICATES SCREWDRIVER ADJUSTMENT

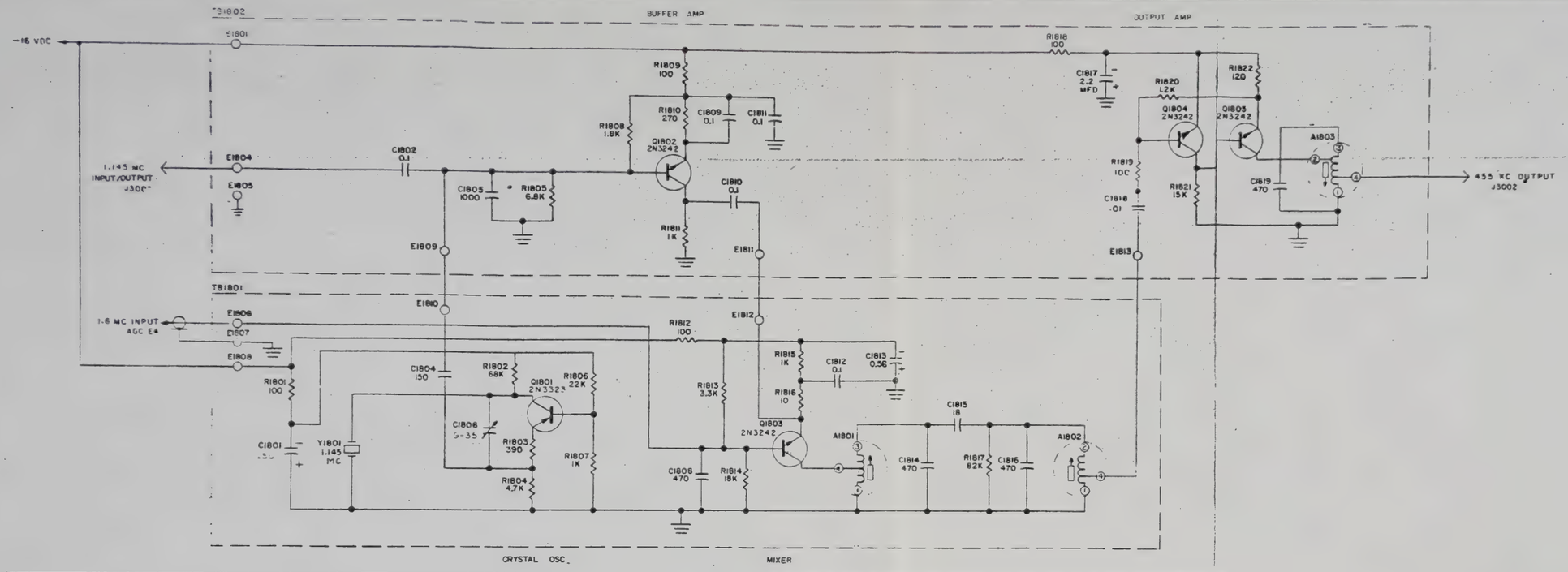




*COMPONENTS MARKED THUS ARE LOCATED ON PRINTED CIRCUIT BD. TB1

RACAL
POWER UNIT MA-6302
DWG NO. G-01311
PL = A-02088
SERIES NO. = 1300


E15
P1
-16 UNREG
7
-16 REG
3
1
2
22.5 VRMS
10
11
12
POWER ON/OFF SWITCH
15
13
14
EXTERNAL GRD
4
9
POWER ON/OFF SWITCH
8
6
5
E1
*C1 .02
*C2 .02
*R1 100K
E2
S1
234 VRMS
117 VRMS
T1
2
3
7
8
9
13
14
F2 1.0 AMP
E9
*CR1
A
B
C
D
E10
E11
R2 10 2W
E3
CR2 *IN916
CR3 *IN916
*Q1 2N3242
*CR4 IN626
*R4 68
*C5 0.1
C3 500 uf
C4 500uf
*R3 18K 1W
E7
E8
P2 117/234 VAC
W1
F1 0.5 AMP
E9
E13
*CR5
A
B
E12
E15
P1-7
C
D
E14
E10
*COMPONENTS M
ON PRINTED CIR



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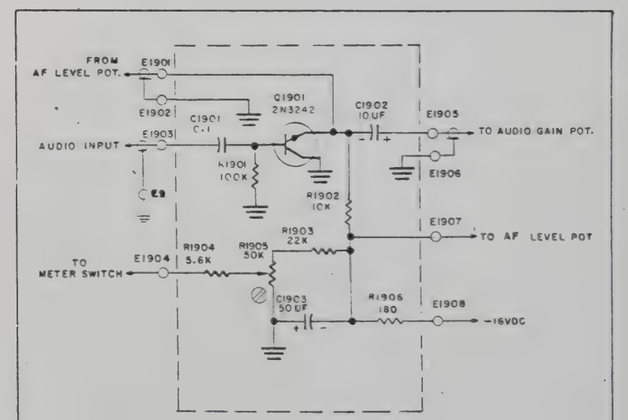
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
CONVERTER
DWG. NO. G01592C
SERIES 1800



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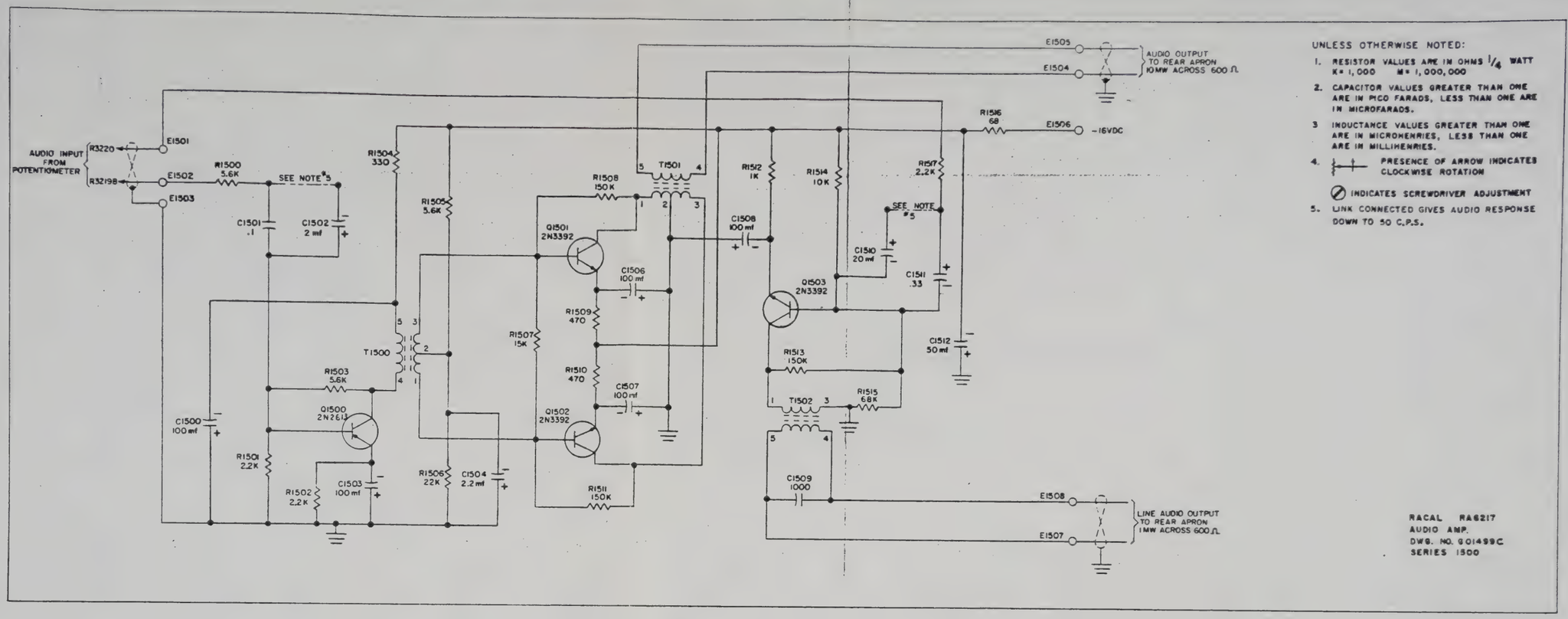
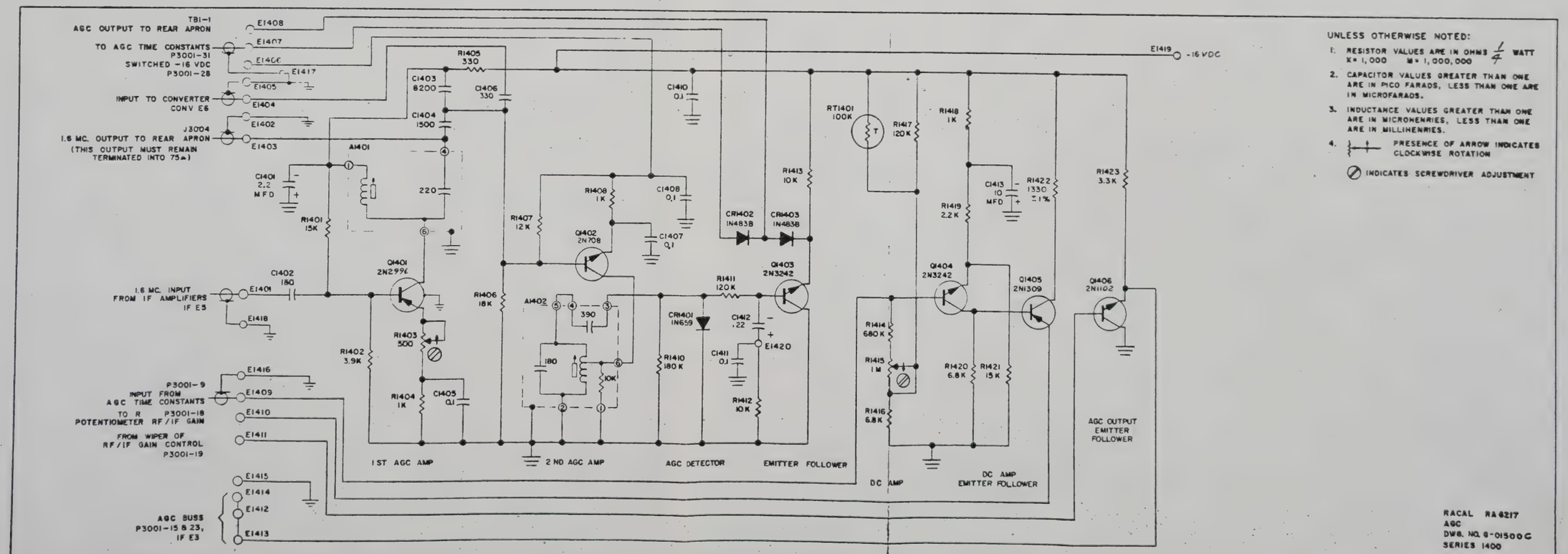
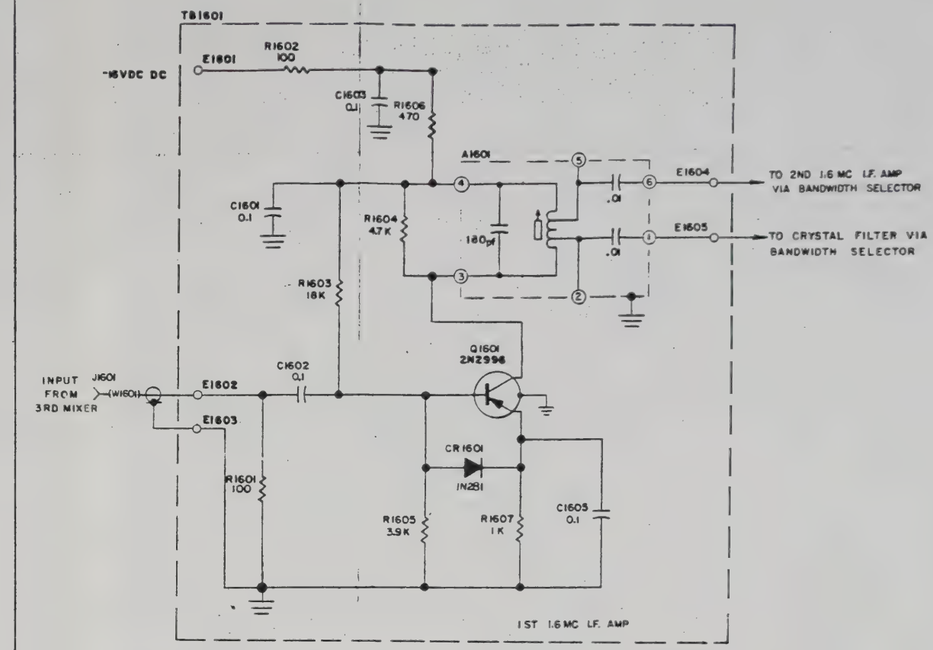
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
EMITTER FOLLOWER & METER ZERO
DWG. NO. G01758
SERIES 1900


AUDIO INPUT FROM POTENTIOMETER
R3220
R32198
E1501
E1502
E1503
R1500 5.6K
SEE NOTE #5
C1501 .1
C1502 2 mf
R1504 330
R1505 5.6K
T1500
R1503 5.6K
Q1500 2N2613
C1500 100 mf
R1501 2.2K
R1502 2.2K
C1503 100 mf
R1506 22K
C1504 2.2 mf
R1508 150K
T1501
Q1501 2N3392
C1506 100 mf
R1509 470
R1507 15K
R1510 470
C1507 100 mf
Q1502 2N3392
R1511 150K
C1508 100 mf
R1512 1K
R1514 10K
R1516 68
E1506 -16VDC
R1517 2.2K
SEE NOTE #5
C1510 20 mf
C1511 .33
Q1503 2N3392
C1512 50 mf
R1513 150K
T1502
R1515 6.8K
C1509 1000
E1505
E1504
AUDIO OUTPUT TO REAR APRON 10MW ACROSS 600 Ω
E1508
E1507
LINE AUDIO OUTPUT TO REAR APRON 1MW ACROSS 600 Ω
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3 INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
5. LINK CONNECTED GIVES AUDIO RESPONSE DOWN TO 50 C.P.S.
RACAL RA6217
AUDIO AMP.
DWG. NO. G01499C
SERIES 1500


TB1-1 AGC OUTPUT TO REAR APRON
E1408
TO AGC TIME CONSTANTS P3001-31
E1407
SWITCHED -16 VDC P3001-28
E1406
E1417
E1405
INPUT TO CONVERTER CONV E6
E1404
J3004
1.6 MC. OUTPUT TO REAR APRON (THIS OUTPUT MUST REMAIN TERMINATED INTO 75Ω)
E1402
E1403
A1401
C1401 2.2 MFD
R1401 15K
C1402 180
1.6 MC. INPUT FROM IF AMPLIFIERS IF E5
E1401
E1418
Q1401 2N2996
R1403 500
R1402 3.9K
R1404 1K
C1405 0.1
P3001-9 INPUT FROM AGC TIME CONSTANTS
E1416
E1409
TO R P3001-18 POTENTIOMETER RF/IF GAIN
E1410
FROM WIPER OF RF/IF GAIN CONTROL P3001-19
E1411
AGC BUSS P3001-15 & 23, IF E3
E1415
E1414
E1412
E1413
R1405 330
C1403 8200
C1404 1500
C1406 330
220
R1408 1K
C1408 0.1
R1407 12K
Q1402 2N708
C1407 0.1
R1406 18K
A1402
390
180
10K
1ST AGC AMP
2ND AGC AMP
C1410 0.1
R1411 120K
CR1401 1N659
R1410 180K
C1411 0.1
C1412 .22
E1420
R1412 10K
AGC DETECTOR
EMITTER FOLLOWER
R1413 10K
CR1402 1N4838
CR1403 1N4838
Q1403 2N3242
E1419 -16 VDC
RT1401 100K
R1417 120K
R1414 680K
R1415 1M
R1416 6.8K
DC AMP
R1418 1K
R1419 2.2K
C1413 10 MFD
R1422 1330 ±1%
R1420 6.8K
R1421 15K
Q1404 2N3242
Q1405 2N1309
DC AMP EMITTER FOLLOWER
R1423 3.3K
Q1406 2N1102
AGC OUTPUT EMITTER FOLLOWER
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
RACAL RA6217
AGC
DWG. NO. G-01500C
SERIES 1400

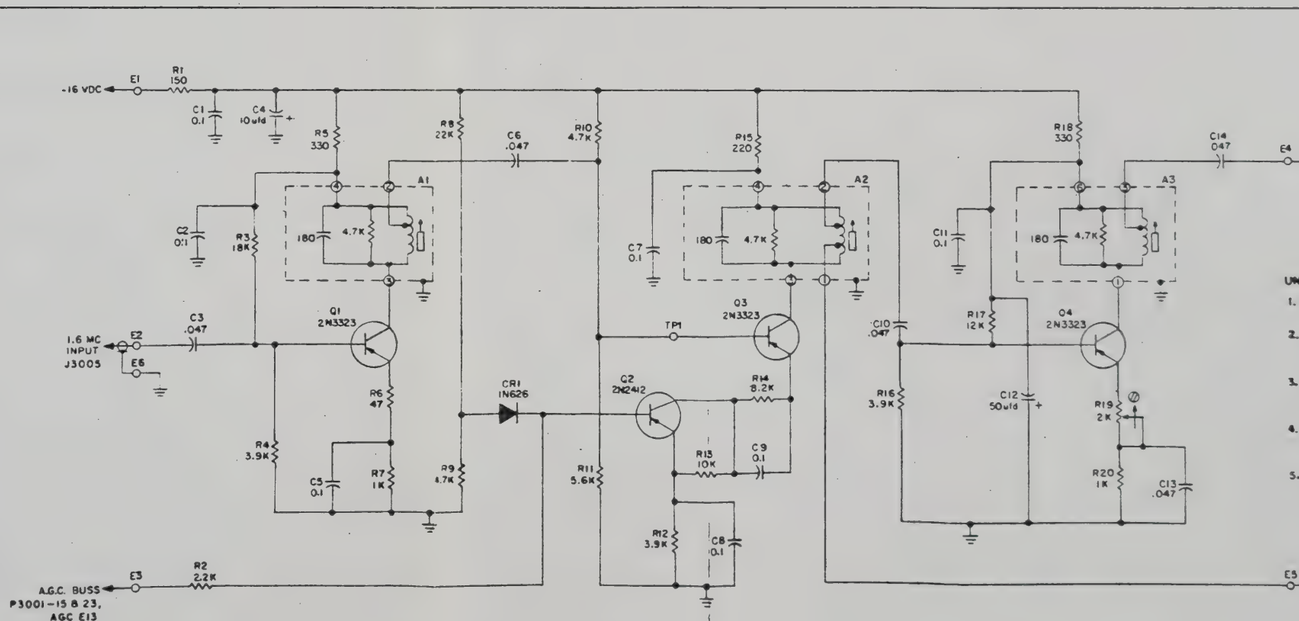


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

⊘ INDICATES SCREWDRIVER ADJUSTMENT

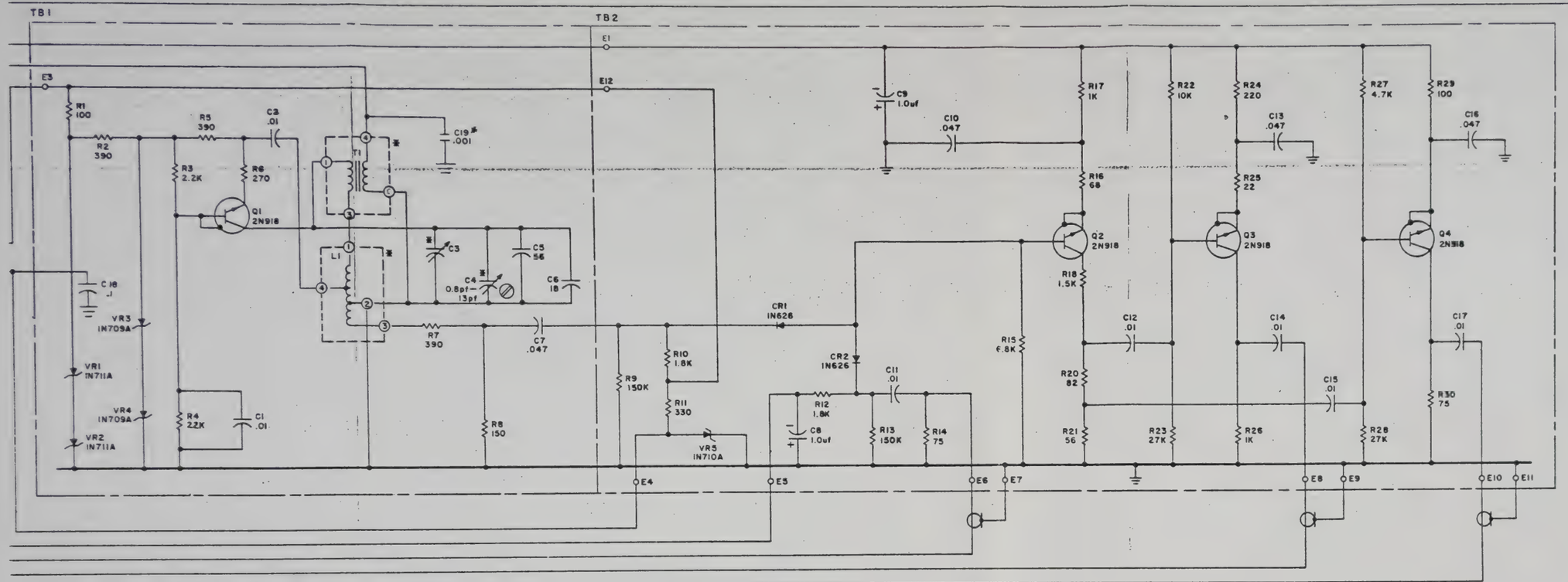
RACAL RA6217
IF UNIT
DWG. NO. G01505
SERIES 1600



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. ALL COMPONENTS ARE ASSEMBLED ON P.C. BOARD NO. TB1

RACAL RA6217
2ND, 3RD, 4TH I.F. AMP
DWG NO. G-01501
SERIES 1700



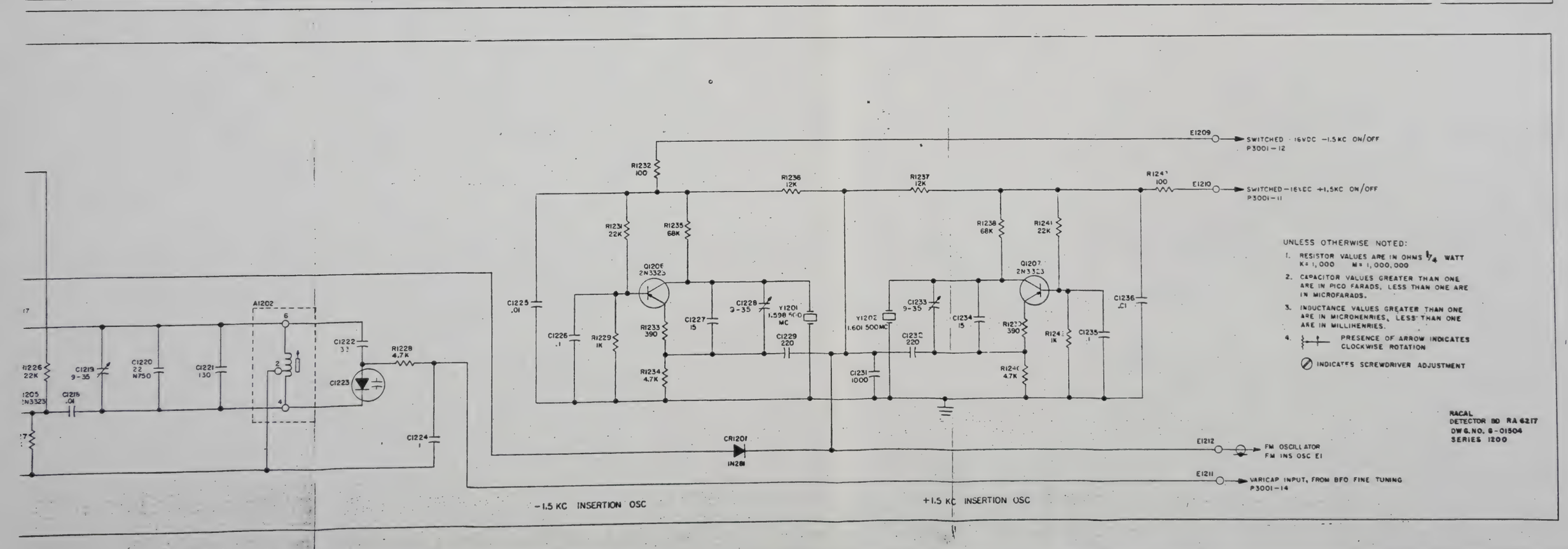
UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

⊘ INDICATES SCREWDRIVER ADJUSTMENT

*PRESENCE OF ASTERISK INDICATES COMPONENT IS NOT MOUNTED ON THE BOARD.

RACAL RA 6217
2ND V.F.O.
DWG NO. G-01309 J
SERIES 1000

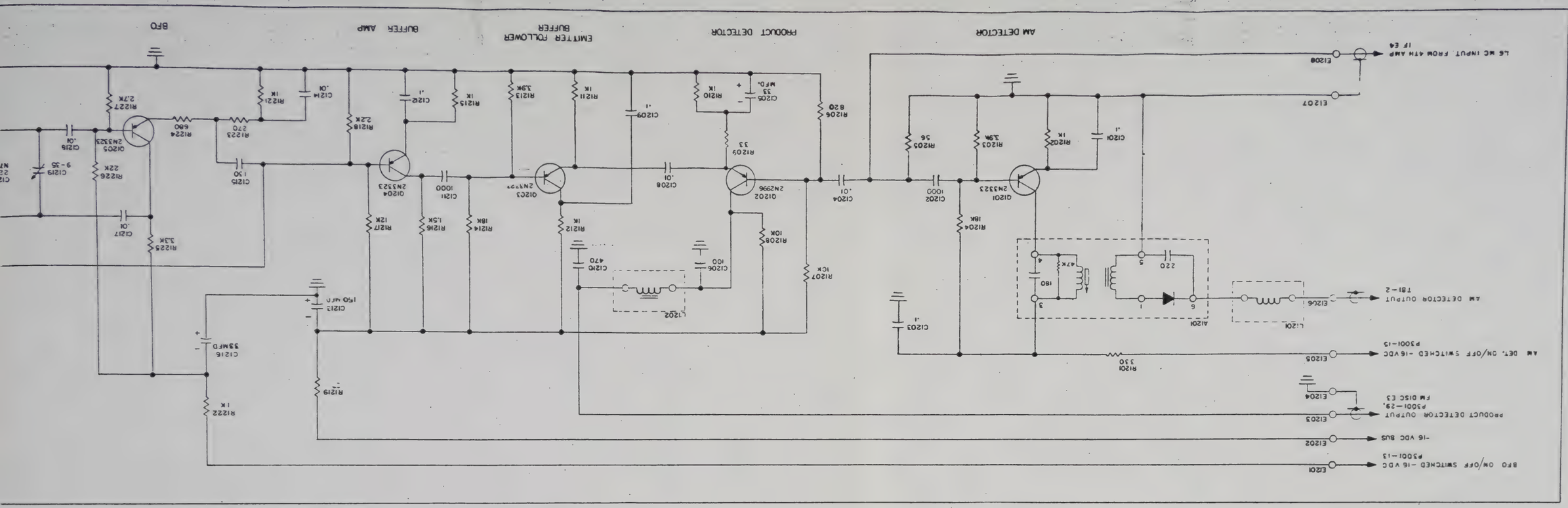


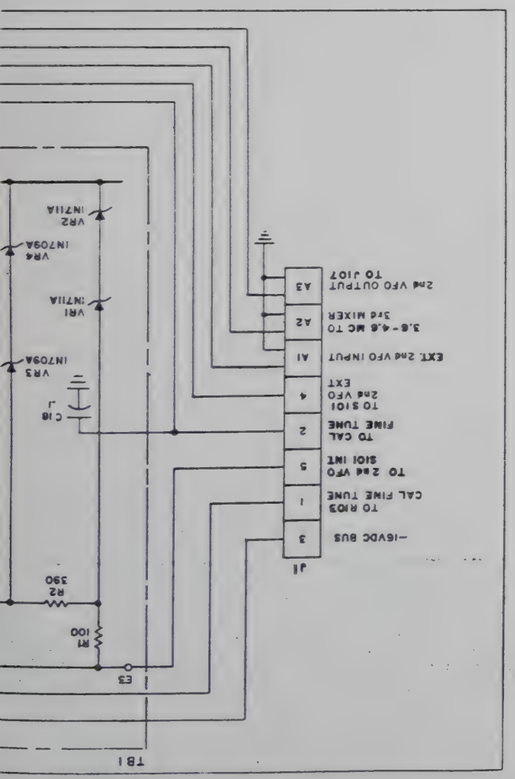
UNLESS OTHERWISE NOTED:

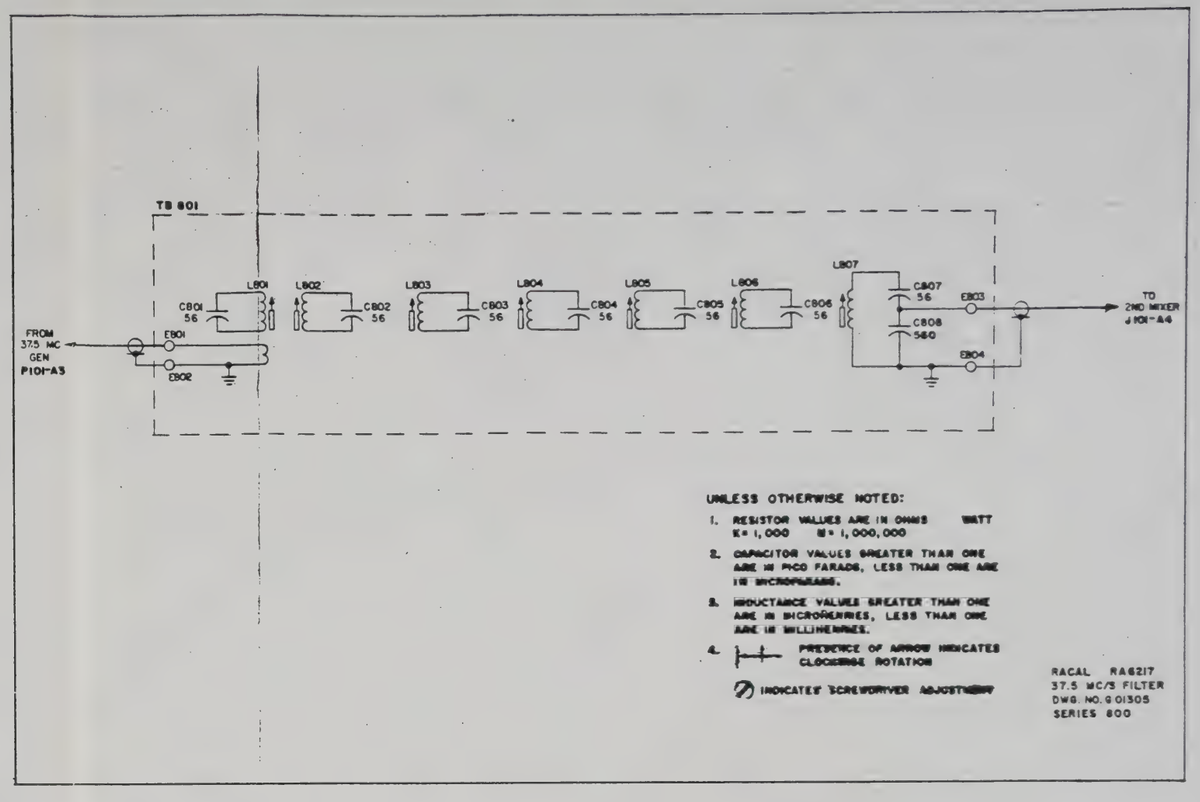
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K= 1,000 M= 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

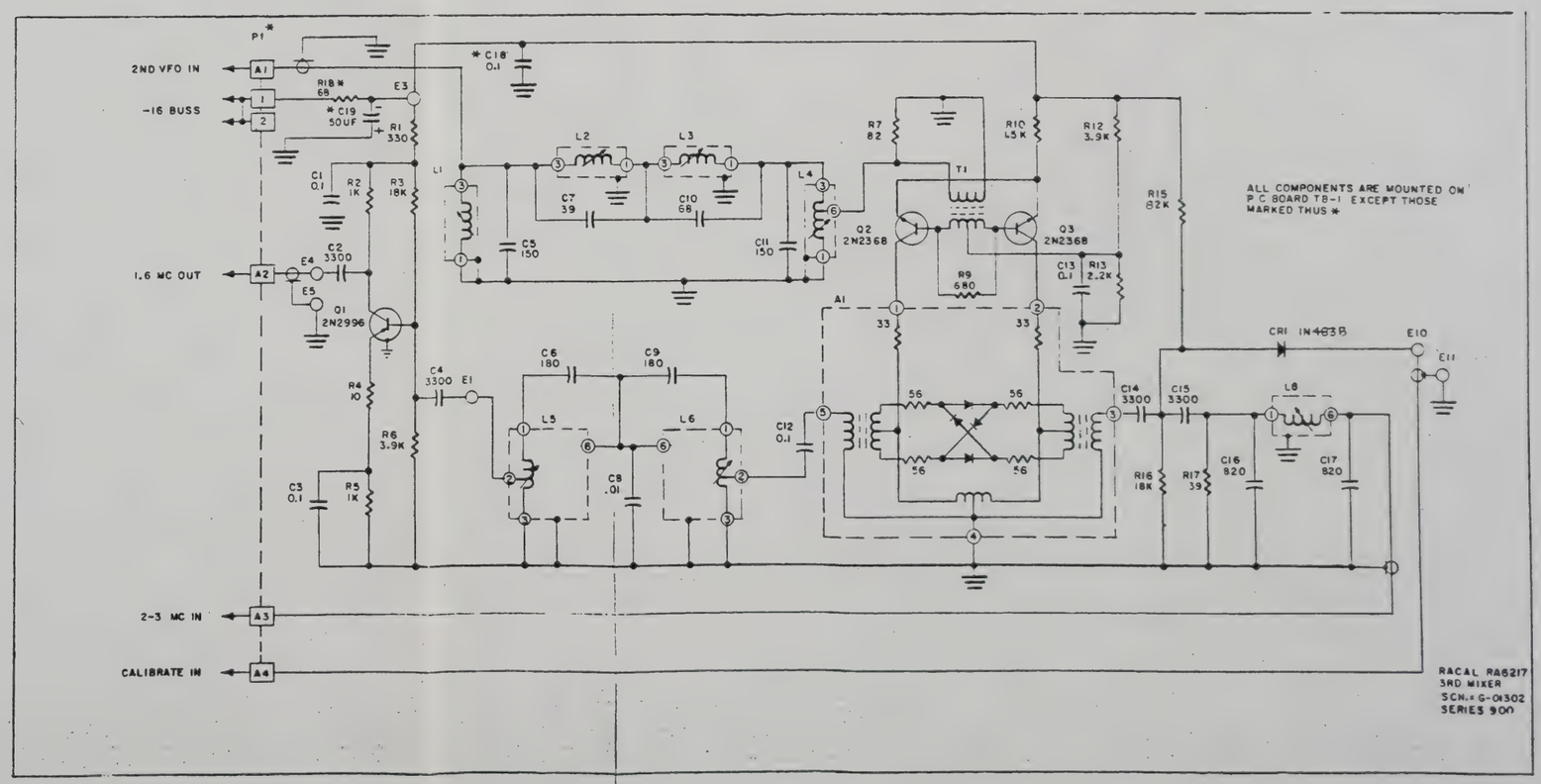
⊘ INDICATES SCREWDRIVER ADJUSTMENT

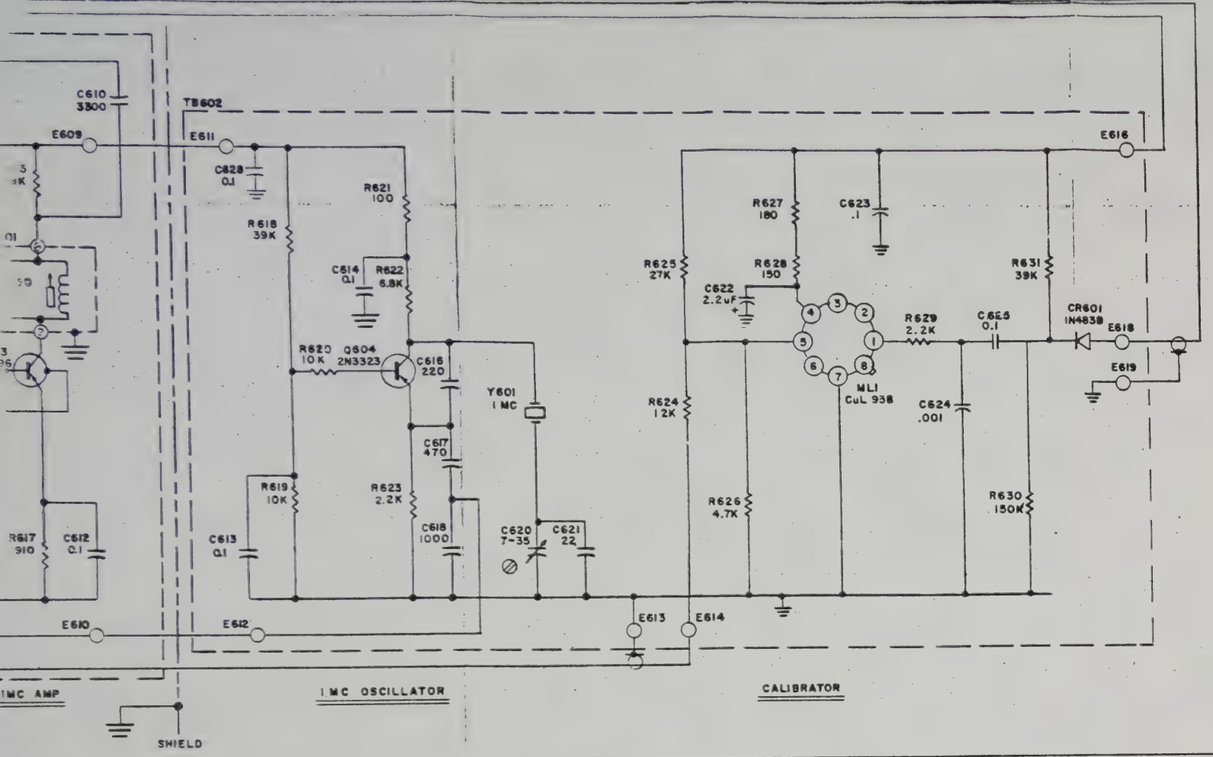
RACAL
DETECTOR BD RA 6217
DWG. NO. G-01304
SERIES 1200


AM DETECTOR
PRODUCT DETECTOR
EMITTER FOLLOWER BUFFER
BUFFER AMP
BFO
LG MC INPUT FROM 4TH AMP IF E4
E1208
E1207
AM DETECTOR OUTPUT TB1-2
E1206
AM DET. ON/OFF SWITCHED -16VDC P5001-15
E1205
PRODUCT DETECTOR OUTPUT P5001-29, FM DISC E3
E1204
-16 VDC BUS
E1202
BFO ON/OFF SWITCHED -16 VDC P5001-13
E1201
Q1201 2N3323
Q1202 2N2996
Q1203 2N3707
Q1204 2N3323
Q1205 2N3323
R1201 330
R1202 1K
R1203 3.9K
R1204 18K
R1205 56
R1206 820
R1207 10K
R1208 10K
R1209 33
R1210 1K
R1211 1K
R1212 1K
R1213 3.9K
R1214 18K
R1215 1K
R1216 1.5K
R1217 12K
R1218 2.2K
R1219
R1222 1K
R1223 270
R1224 680
R1225 3.3K
R1226 22K
R1227 2.7K
C1201 .1
C1202 1000
C1203 .1
C1204 .01
C1205 33 MFD.
C1206 1K
C1207 .1
C1208 .01
C1209 .1
C1210 470
C1211 1000
C1212 .1
C1213 150 MFD
C1214 .01
C1215 130
C1216 33MFD
C1217 .01
C1218 .01
C1219 9-35
A1201
L1201
L1202
6
5
4
3
1
47K
180
220


J1
3 -15VDC BUS
1 TO R103 CAL FINE TUNE
5 TO 2nd VFO SIOI INT
2 TO CAL FINE TUNE
4 TO SIOI 2nd VFO EXT
A1 EXT. 2nd VFO INPUT
A2 3.6-4.6 MC TO 3rd MIXER
A3 2nd VFO OUTPUT TO J107
C18 .1
VR3 IN709A
VR1 IN711A
VR4 IN709A
VR2 IN711A
M1 100
R2 390
E3
TB1


TB 801
L801
L802
L803
L804
L805
L806
L807
C801 56
C802 56
C803 56
C804 56
C805 56
C806 56
C807 56
C808 560
E801
E802
E803
E804
FROM 37.5 MC GEN P101-A3
TO 2ND MIXER J101-A4
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
RACAL RA6217
37.5 MC/S FILTER
DWG. NO. G01305
SERIES 800


P1 *
2ND VFO IN
-16 BUSS
1.6 MC OUT
2-3 MC IN
CALIBRATE IN
A1
A2
A3
A4
1
2
R18 * 68
* C19 50UF
R1 330
* C18 0.1
E3
C1 0.1
R2 1K
R3 18K
C2 3300
E4
E5
Q1 2N2996
C4 3300
E1
R4 10
R6 3.9K
C3 0.1
R5 1K
L1
L2
L3
L4
C5 150
C7 39
C10 68
C11 150
C6 180
C9 180
L5
L6
C8 .01
C12 0.1
R7 82
R10 5.5K
R12 3.9K
T1
Q2 2N2368
Q3 2N2368
R9 580
C13 0.1
R13 2.2K
R15 82K
A1
33
33
56
56
56
56
CR1 IN483B
E10
E11
C14 3300
C15 3300
L8
R16 18K
R17 39
C16 820
C17 820
ALL COMPONENTS ARE MOUNTED ON P.C. BOARD TB-1 EXCEPT THOSE MARKED THUS *
RACAL RA6217
3RD MIXER
SCH. = G-01302
SERIES 900

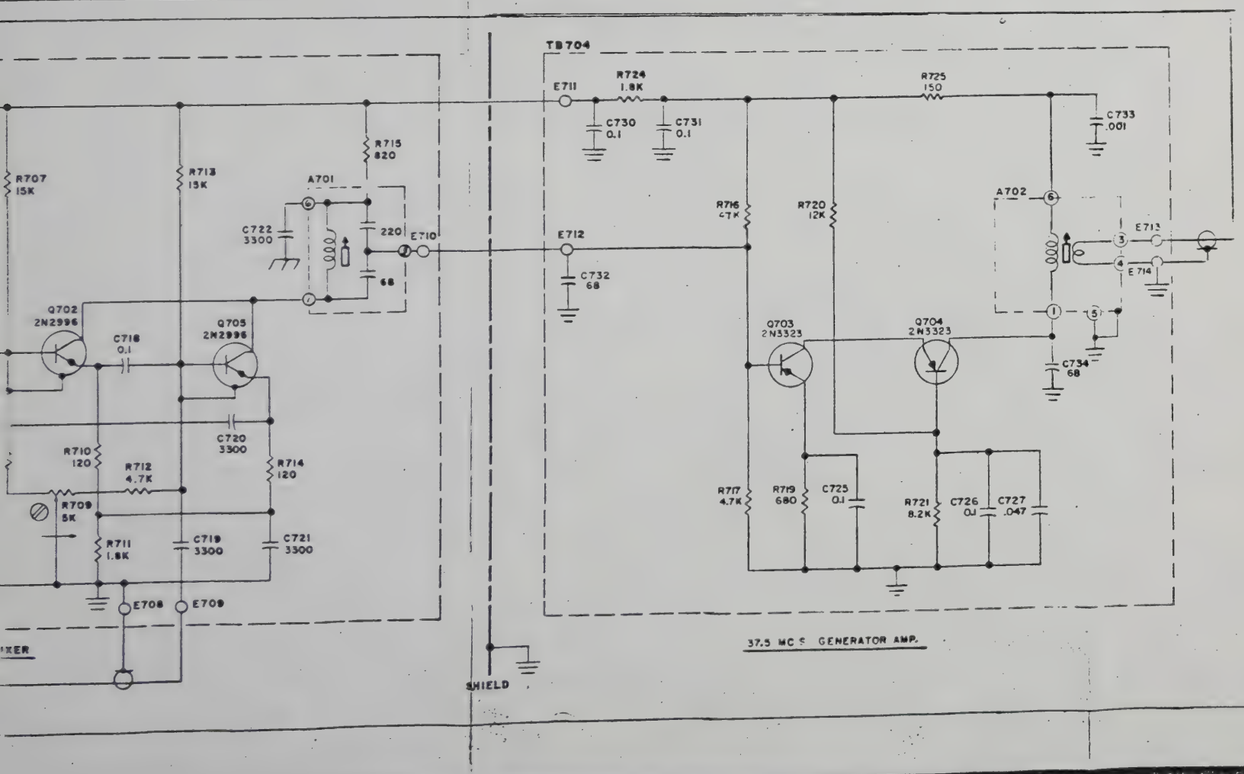


UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

INDICATES SCREWDRIVER ADJUSTMENT

RACAL RA6217
1 MC MODULE & CALIBRATOR
DWG NO. G-03412 B
SERIES 600



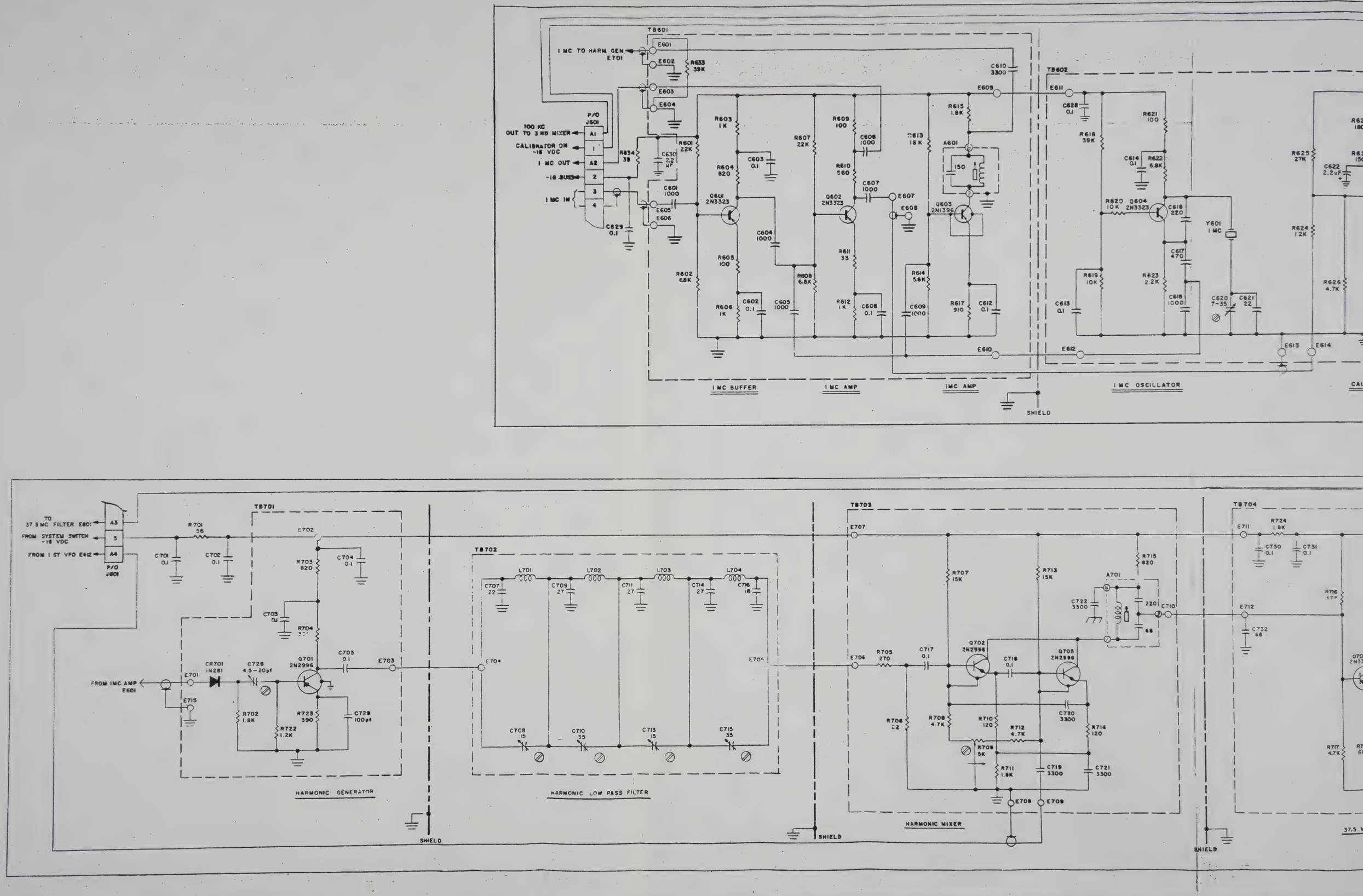
UNLESS OTHERWISE NOTED:

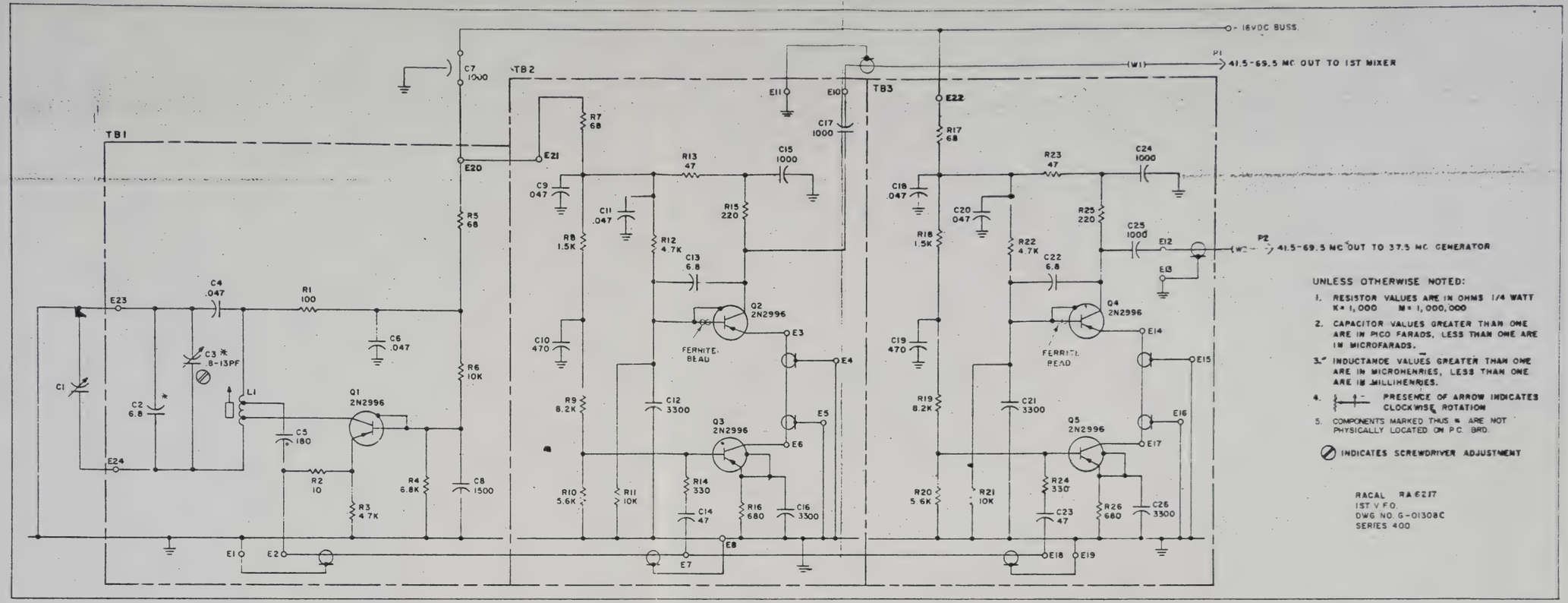
1. RESISTOR VALUES ARE IN OHMS $\frac{1}{4}$ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

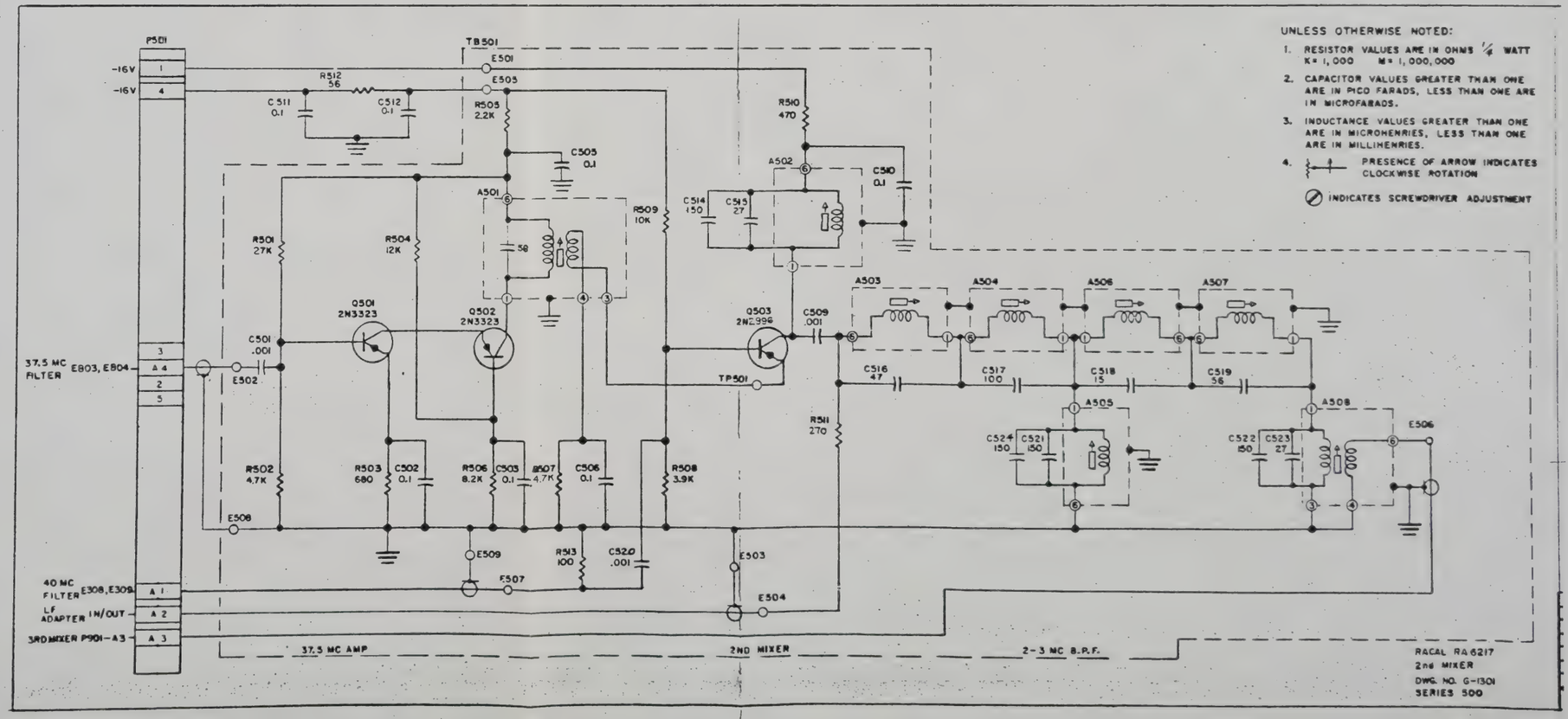
INDICATES SCREWDRIVER ADJUSTMENT

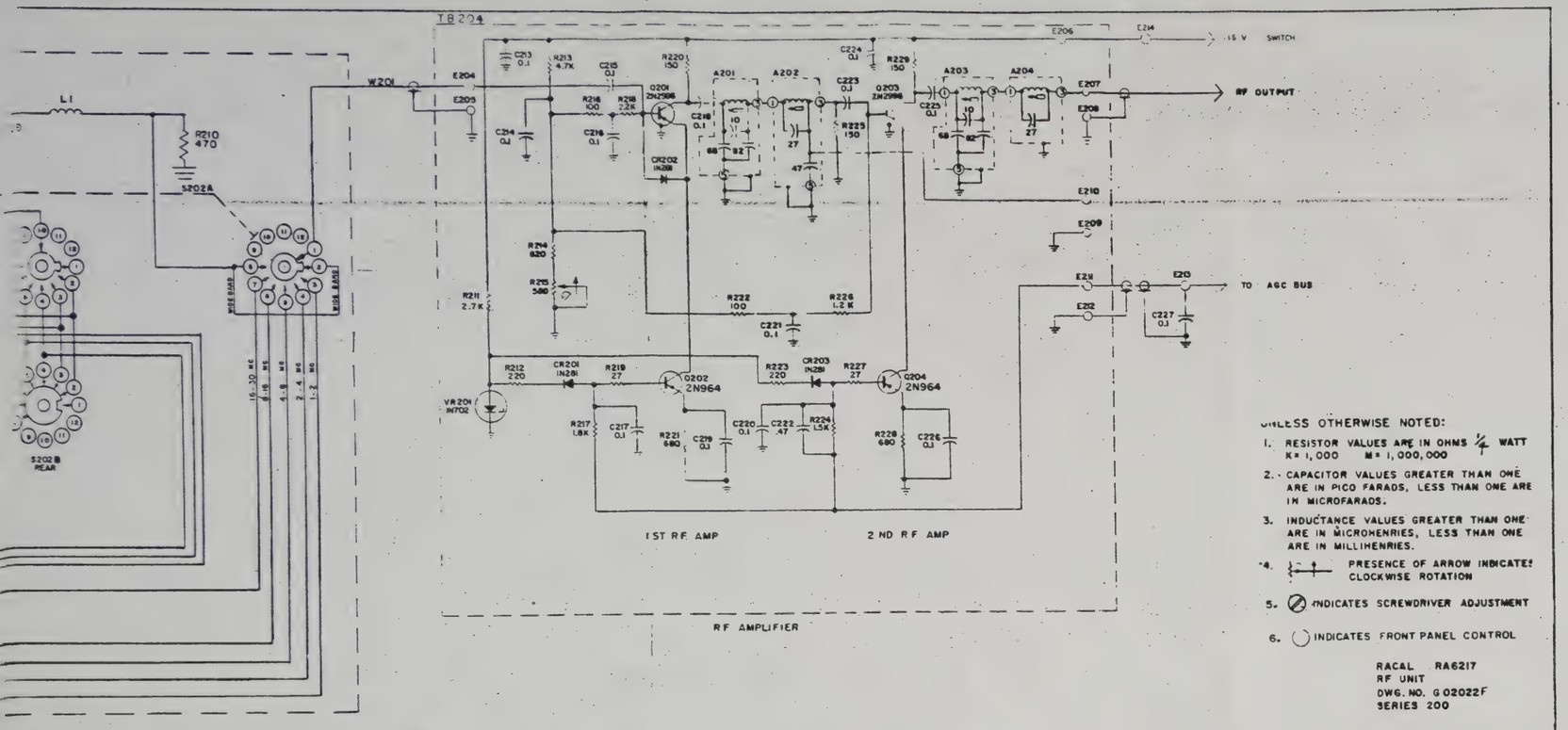
5. ALL COMPONENTS INSIDE BROKEN LINES ARE MOUNTED ON P.C. BOARD.

RACAL RA 6217
37.5 MC/S GENERATOR
DWG. NO. G01303
SERIES 700


TB601
1 MC TO HARM. GEN. E701
E601
E602
R633 39K
E603
E604
P/O J601
100 KC OUT TO 3 RD MIXER
CALIBRATOR ON -18 VDC
1 MC OUT
-18 BUSS
1 MC IN
A1
1
A2
2
3
4
R634 39
C630 22 µF
R601 22K
C601 1000
E605
E606
C629 0.1
R603 1K
R604 820
C603 0.1
R607 22K
R609 100
C606 1000
R610 560
C607 1000
E607
E608
R613 18K
R615 1.8K
A601
150
C610 3300
E609
Q601 2N3323
Q602 2N3323
Q603 2N1396
C604 1000
R611 33
R602 6.8K
R605 100
R608 6.8K
R614 5.6K
R606 1K
C602 0.1
C605 1000
R612 1K
C608 0.1
C609 1000
R617 910
C612 0.1
E610
1 MC BUFFER
1 MC AMP
1 MC AMP
SHIELD
TB602
E611
C628 0.1
R618 39K
R621 100
C614 0.1
R622 6.8K
R620 10K
Q604 2N3323
C616 220
Y601 1 MC
C617 470
R619 10K
R623 2.2K
C618 1000
C613 0.1
C620 7-35
C621 22
E612
E613
E614
R625 27K
C622 2.2 µF
R624 1.2K
R626 4.7K
1 MC OSCILLATOR
TO 37.5 MC FILTER E801
FROM SYSTEM SWITCH -18 VDC
FROM 1 ST VFO E412
A3
5
A4
P/O J601
TB701
R701 56
E702
C701 .01
C702 0.1
R703 820
C704 0.1
C703 .01
R704
C705 0.1
E703
CR701 1N281
C728 4.5–20pf
Q701 2N2996
FROM IMC AMP E601
E701
E715
R702 1.8K
R722 1.2K
R723 390
C729 100pf
TB702
L701
L702
L703
L704
C707 22
C709 27
C711 27
C714 27
C716 18
E704
E705
C708 15
C710 35
C713 15
C715 35
HARMONIC GENERATOR
HARMONIC LOW PASS FILTER
SHIELD
TB703
E707
R707 15K
R713 15K
R715 820
A701
C722 3300
220
E710
68
E706
R705 270
C717 0.1
Q702 2N2996
C718 0.1
Q705 2N2996
R706 22
R708 4.7K
R710 120
R712 4.7K
C720 3300
R714 120
R709 5K
R711 1.8K
C719 3300
C721 3300
E708
E709
HARMONIC MIXER
SHIELD
TB704
E711
R724 1.8K
C730 0.1
C731 0.1
E712
C732 68
R716 47K
R717 4.7K
37.5 M
SHIELD


+16VDC BUSS.
P1
41.5-69.5 MC OUT TO 1ST MIXER
P2
41.5-69.5 MC OUT TO 37.5 MC GENERATOR
TB1
TB2
TB3
FERRITE BEAD
FERRITE BEAD
UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. COMPONENTS MARKED THUS * ARE NOT PHYSICALLY LOCATED ON P.C. BRD.
INDICATES SCREWDRIVER ADJUSTMENT
RACAL RA 6217
1ST V.F.O.
DWG NO. G-01308C
SERIES 400

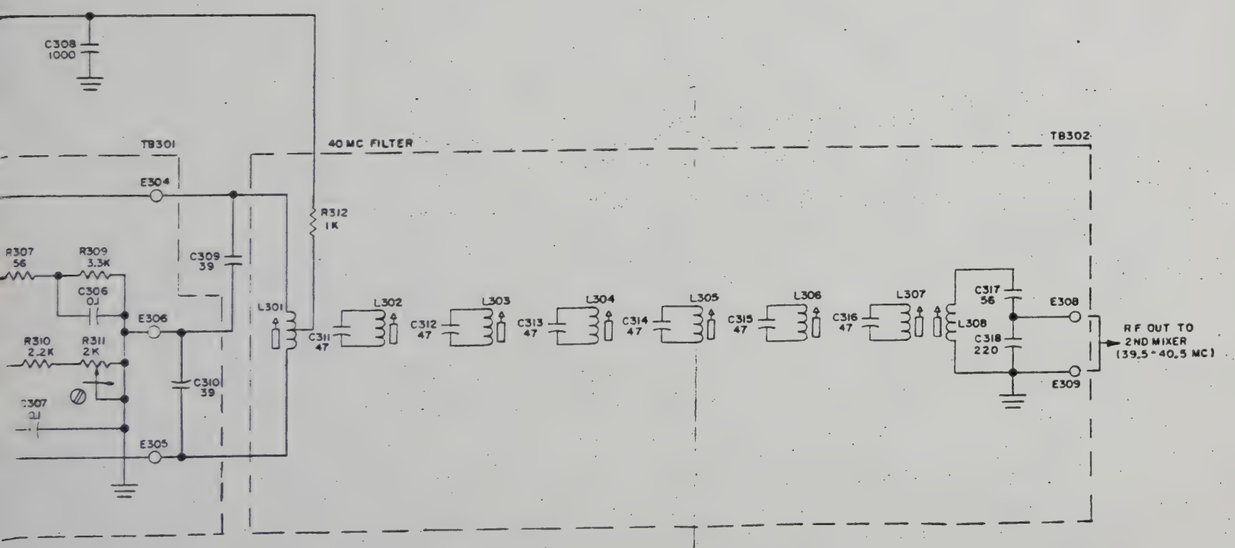

UNLESS OTHERWISE NOTED:
1. RESISTOR VALUES ARE IN OHMS 1/4 WATT K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
INDICATES SCREWDRIVER ADJUSTMENT
37.5 MC AMP
2ND MIXER
2-3 MC B.P.F.
RACAL RA 6217
2nd MIXER
DWG NO. G-1301
SERIES 500



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. ⊢ PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION
5. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
6. ◯ INDICATES FRONT PANEL CONTROL

RACAL RA6217
RF UNIT
DWG. NO. G02022F
SERIES 200



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS ¼ WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES.
4. ⊢ PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION

⊘ INDICATES SCREWDRIVER ADJUSTMENT.

RACAL RA 6217
1 ST. MIXER & 40 MC FILTER
DWG. NO. G 01304
SERIES 300

R.F. ATTENUATOR

ANTENNA 30 MC LPF

ANTENNA TUNED CIRCUITS

RF AMPLIFIER

1ST RF AMP

2ND RF A

1ST MIXER

40 MC FILTER

OUT

OUT
NOTE 7)
LOAD

A112
AUDIO BD
SCH. NO. G-01499
SERIES 1500

E1501 AF IN (1MW AMP)
E1502 AF IN (10 MW AMP)
E1503 GRD
E1507 } 1MW OUT
E1508 -16 VDC
E1504 } 10 MW OUT
E1505

-16 VDC
AGC BUS
S102 (SEE NOTE 8)
S103 (SEE NOTE 8)

S104
M101
CR101
R105 3K
J108
PHONES
C103 .001
C104 .001

ALTERNATIVE POWER SUPPLIES

MA-6300	AC POWER UNIT/BATTERY CHARGER	SCH. G-02535
MA-6301	DC TO DC CONVERTER	SCH. G-02449
MA-6302	AC POWER UNIT	SCH. G-01311
MA-6704	BATTERY PACK	SCH. G-02463

J109: 3 -16 VDC; 7 -16 VDC UNREG.; 1 -16 VDC; 4 EXT GRD; 9 EXT GRD; 2 -16 VDC; 11 } 22.5 VAC; 10 GRD; 12 GRD; 5 GRD; 6 GRD; 8 GRD; 14; 13; 15

TB101
1 -16V UNREG
3 -16V REG
2 -16V SW
4 AGC BUS
5 } 600 OHM 10 MW
6
7 } 600 OHM 1MW
8

DS101
DS102
S105 P/O S106 ON
R106 1K DIMMER

S106-A (FRONT): OFF, MAN, SM, MED, LG
C105 2.2uf; R107 68K; C106 .1; C107 .47; C108 6.8uf; R108 120K
S106-B (FRONT): OFF, MAN, SM, MED, LG
S106-A (REAR): OFF, MAN, SM, MED, LG, AGC, CAL, CHECK BFO
S106-B (REAR): OFF, MAN, SM, MED, LG, CAL, CHECK BFO
C109 .1
S106-C (FRONT): OFF, MAN, SM, MED, LG, CAL, CHECK BFO

S106-A,B,C
SYSTEM SWITCH

UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS,
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION.
5. HEAVY LINE SIGNIFIES SIGNAL PATH
6. RESISTORS MARKED THUS ※ ARE CHOSEN ON TEST.
7. SHORT BETWEEN 2 & 3 MUST BE IN POSITION FOR CORRECT OPERATION OF RECEIVER.
8. SWITCH ACTIVATED BY MC DRIVE WHEN MC IS TUNED TO 00 MC.
9. ⊕ INDICATES FRONT PANEL LOCATION
10. ⊖ INDICATES REAR PANEL LOCATION
11. ⊘ INDICATES SCREWDRIVER ADJUSTMENT

RACAL
RECEIVER RA 6217A
DWG. NO. G 01310 E
SERIES 100

A110
IF & XTAL FILTER ASSEMBLY
SCH. NO. = THIS DWG
SERIES 3200

S1-A,C,D,B
IF BW KC

S1-C(FRONT)

S1-D(FRONT)

S1-B(FRONT)

FL2 200CPS
FL3 1KC
FL4 3KC
FL5 6KC

R3 100

R4 56

S1-C(REAR)

S1-D(REAR)

S1-B(REAR)

W1

P2 J3005
J1 P3001

15	AGC(EMITTER OF 2nd DC AMP)
23	AGC BUS
24	GND
2	-18V BUS (TO DET, FM DISC, CONV.)
28	TO AGC AMP
9	AGC TIME CONSTANT
10	GND
31	AGC TIME CONSTANT
32	GND
1	TO IF, AGC -18VDC
14	TO VARICAP IN BFO
4	TO FM DISC
3	TO FM OSC
11	TO 1.6015 MC OSC
12	TO 1.5985 MC OSC
5	TO AM DET
13	TO BFO
29	DETECTED PROD AUDIO
30	GND
16	FM VIDEO OUTPUT
17	GND
7	DETECTED AM TO VOLTAGE DIVIDER
8	GND
18	AGC EMITTER OF DC AMP EF Q 1309
19	AGC BASE OF EF Q1408

-18V SWITCHED

A111
IF PKG
SCH NO G-02028
SERIES 3000

REF

J2 455KC OUT

J3 1.1454MC IN-OUT

J4 1.6MC OUT

TB1
1 AGC OUT
2 AM DET OUT (SEE NOTE 7)
3 AM DET LOAD

-18 VDC

S102 (SEE NOTE 8)

AGC BUS

S103 (SEE NOTE 8)

A112
AUDIO BD
SCH. NO G-01499
SERIES 1500

E1501 AF IN (1 MW AMP)
E1502 AF IN (10 MW AMP)
E1503 GND
E1507 } 1 MW OUT
E1508
E1504 -15 VDC
E1505 } 10 MW OUT

J108
PHONES

C103 .001
C104 .001

S2-B(FRONT)

S2-A (FRONT)

BR11
R12 1K
R13 2K
R14 22K
R15 39K

R17 8.2K

R16 39K

S2-B(REAR)

A3202
EF & METER ZERO
SCH NO G-01768
SERIES 1900
METER ZERO E1904

GND E1902
AF OUT E1901 (EF)

E1903 AF IN
E1909 GND
E1908 -18 VDC
E1905 AF OUT (EF)
E1906 GND
E1907 -18 VDC (DECOUPLED)

R18 1
R19A 500 IF GAIN

C1 .001

R20 10K AF LEVEL

R19B 10K AF GAIN

3104

RF LEVEL

AF LEVEL

M101

CR101

R105 3K

A101
RF UNIT
SCH. NO. G-02022
SERIES 200

A102
1st MIXER
& 40 MC FILTER
SCH. NO. G-01304
SERIES 300

A103
2nd MIXER
SCH NO G-01301
SERIES 500

A104
3rd MIXER
SCH NO G-02291
SERIES 900

A3201
1 ST IF AMP
SCH NO G-01505
SERIES 1600

IF & XTAL
SCH
S

A105
1st VFO
SCH NO G-01308
SERIES 400

A106
37.5MC
FILTER
SCH NO G-01305
SERIES 800

A107
2nd VFO
SCH. NO. G-01309
SERIES 1000

A109
IMC MODULE &
CALIBRATOR
SCH NO G-01312
SERIES 600

A108
37.5 MC
GENERATOR
SCH. NO. G-01303
SERIES 700

ANTENNA (REF)

R101 68
R102 68
C101 0.1
C102 0.1
C110 .001
C111 001

FL1 13KC

R1 220

S1-A(FRONT)
S1-A(REAR)
S1-A,C,D,B
IF BW KC
6KC
3KC
1KC
0.2KC
13KC
FL2 200CPS
FL3 1KC
FL4 3KC
FL5 6KC

S2-L(FRONT)
S2-B(FRONT)
S2-C(REAR)
S2-B(REAR)
S2-C,B,A
DET BFO MODE
R5 10K BFO TUNE KC
R6 15K
R7 6.8K
R8 6.8K
R9 4.7K
R10 4.7K
R11
R12 1K
R13 2K
R14 22K
R15 39K
FM
+15
-15
AM
+6
+3
-6
-3
0

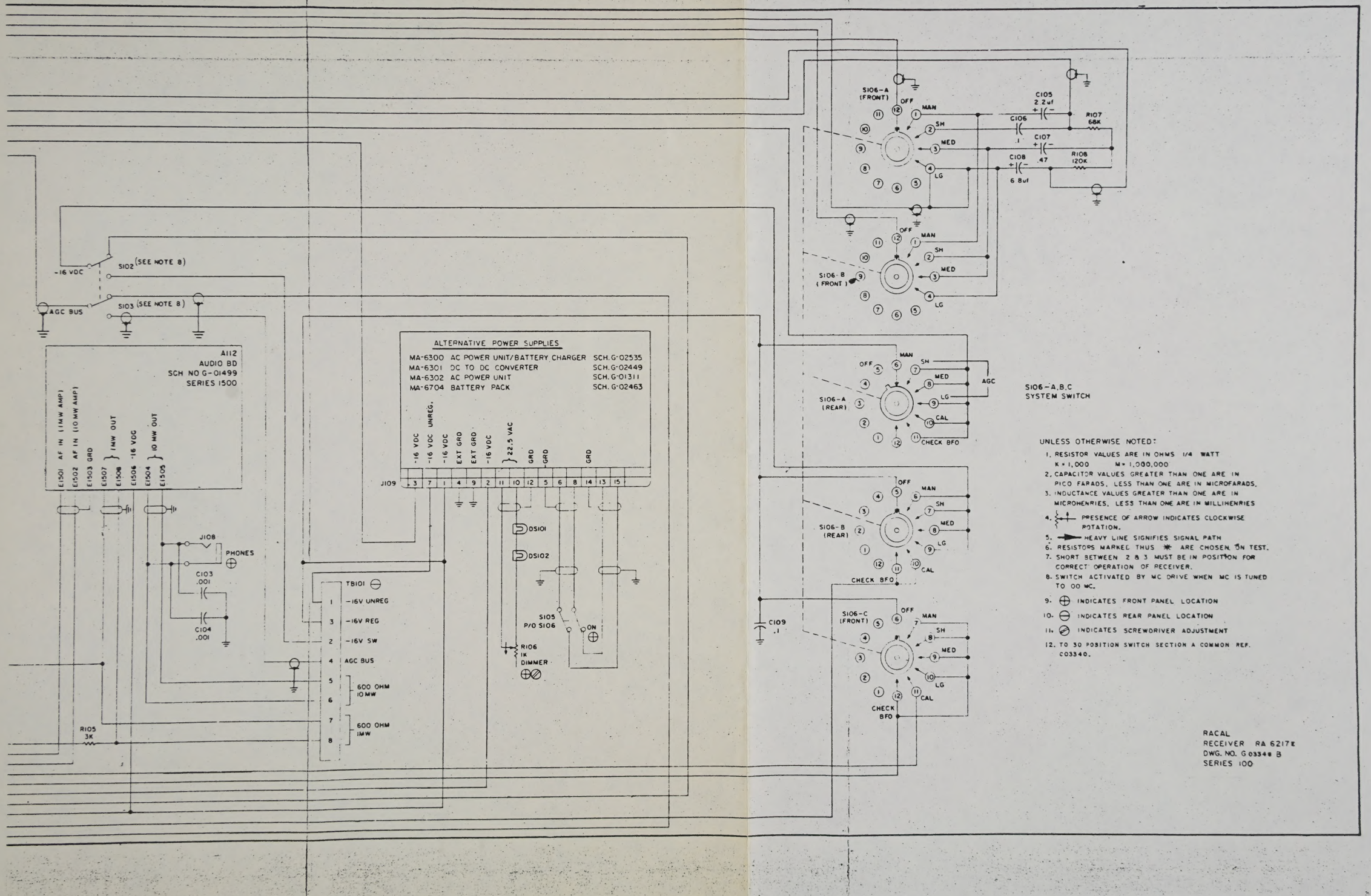
R103 500
CAL.- FINE TUNE
C112 0.1
INT.
EXT.
S101 2nd VFO

R104 680
AT101 75

J102 1 MC OUT
J103 1 MC IN
J104 2-3 MC OUT
J105 2-3 MC IN
J106 2ND VFO IN
J107 2ND VFO OUT
J113 1.6 MC WIDE OUT

-16 V SEE NOTE 12

-16 VDC
-16VDC BUS
-16 VDC
AGC BUS



UNLESS OTHERWISE NOTED:

1. RESISTOR VALUES ARE IN OHMS 1/4 WATT
   K = 1,000 M = 1,000,000
2. CAPACITOR VALUES GREATER THAN ONE ARE IN PICO FARADS, LESS THAN ONE ARE IN MICROFARADS.
3. INDUCTANCE VALUES GREATER THAN ONE ARE IN MICROHENRIES, LESS THAN ONE ARE IN MILLIHENRIES
4. PRESENCE OF ARROW INDICATES CLOCKWISE ROTATION.
5. HEAVY LINE SIGNIFIES SIGNAL PATH
6. RESISTORS MARKED THUS * ARE CHOSEN ON TEST.
7. SHORT BETWEEN 2 & 3 MUST BE IN POSITION FOR CORRECT OPERATION OF RECEIVER.
8. SWITCH ACTIVATED BY MC DRIVE WHEN MC IS TUNED TO 00 MC.
9. ⊕ INDICATES FRONT PANEL LOCATION
10. ⊖ INDICATES REAR PANEL LOCATION
11. ⊘ INDICATES SCREWDRIVER ADJUSTMENT
12. TO 30 POSITION SWITCH SECTION A COMMON REF. C03340.

RACAL
RECEIVER RA 6217E
DWG. NO. G 03348 B
SERIES 100

A101
RF UNIT
SCH NO G-02022
SERIES 200

A102
1st MIXER
& 40 MC FILTER
SCH. NO.G-01304
SERIES 300

A103
2nd MIXER
SCH NO G-01301
SERIES 500

A104
3rd MIXER
SCH NO G-02291
SERIES 900

A3201
1 ST IF AMP
SCH NO G-01505
SERIES 1600

IF &

ANTENNA (REF)

R101 68
R102 68
C101 0.1
C102 0.1
C110 .001
C111 .001

A105
1st VFO
SCH NO G-01308
SERIES 400

A106
37.5MC
FILTER
SCH NO.G-01305
SERIES 800

A107
2nd VFO
SCH NO.G-01309
SERIES 1000

A109
IMC MODULE & CALIBRATOR
SCH. NO. G-01312
SERIES 600

A108
37.5 MC
GENERATOR
SCH. NO.G-01303
SERIES 700

R103 500
CAL.- FINE TUNE
C112 0.1
INT.
EXT.
S101
2nd VFO

R104 680
AT101 75

J102 1 MC OUT
J103 1 MC IN
J104 2-3 MC OUT
J105 2-3 MC IN
J106 2 ND VFO IN
J107 2 ND VFO OUT
J113 1.6 MC WIDE OUT

-18 V SEE NOTE 12

FL1 13KC
R1 220

S1-A(FRONT)
S1-A(REAR)
S1-A,C,D,B IF BW KC
FL2 OUT 200CPS
FL3 1KC
FL4 3KC
FL5 6KC

S2-C(FRONT)
S2-B(FRONT)
R5 10K BFO TUNE KC
R6 15K
R7 6.8K
R8 6.8K
R9 4.7K
R10 4.7K
R11
R12 1K
R13 2K
R14 22K
R15 39K

S2-C,B,A DET BFO MODE
FM
+1.5
-1.5
AM
+6
+3
0
-3
-6

S2-C(REAR)
S2-B(REAR)

-16 VDC
-16VDC BUS
-16 VDC
AGC BUS

A110
IF & XTAL FILTER ASSEMBLY
SCH. NO. = THIS DWG
SERIES 3200

S1-A,C,D,B
IF BW KC

S1-C(FRONT)
S1-C(REAR)
S1-D(FRONT)
S1-D(REAR)
S1-B(FRONT)
S1-B(REAR)

FL2 200CPS
FL3 1KC
FL4 3KC
FL5 6KC

R2 47
R3 100
R4 56

W1

P2 J3005
J1 P3001

A111
IF PKG
SCH NO G-02028
SERIES 3000

15	AGC (EMITTER OF 2nd DC AMP)
23	AGC BUS
24	GRD
2	-16V BUS (TO DET, FM DISC., CONV.)
28	TO AGC AMP
9	AGC TIME CONSTANT
10	GND
31	AGC TIME CONSTANT
32	GND
1	TO IF, AGC -16VDC
14	TO VARICAP IN BFO
4	TO FM DISC
3	TO FM OSC
11	TO 1.6015 MC OSC
12	TO 1.5985 MC OSC
5	TO AM DET
13	TO BFO
29	DETECTED PROD AUDIO
30	GND
16	FM VIDEO OUTPUT
17	GND
7	DETECTED AM TO VOLTAGE DIVIDER
8	GND
18	AGC EMITTER OF DC AMP EF Q 1309
19	AGC BASE OF EF Q1406

-16V SWITCHED

REF
J2 455KC OUT
J3 1.145MC IN-OUT
J4 1.6MC OUT

TB1
1 AGC OUT
2 AM DET OUT (SEE NOTE 7)
3 AM DET LOAD

S102 (SEE NOTE 8)
S103 (SEE NOTE 8)
-16 VDC
AGC BUS

A112
AUDIO BD
SCH NO G-01499
SERIES 1500

E1501 AF IN (1 MW AMP)
E1502 AF IN (10 MW AMP)
E1503 GRD
E1507 } 1 MW OUT
E1508
E1506 -16 VDC
E1504 } 10 MW OUT
E1505

J108
PHONES
C103 .001
C104 .001

S2-B(FRONT)
S2-A (FRONT)
S2-B(REAR)

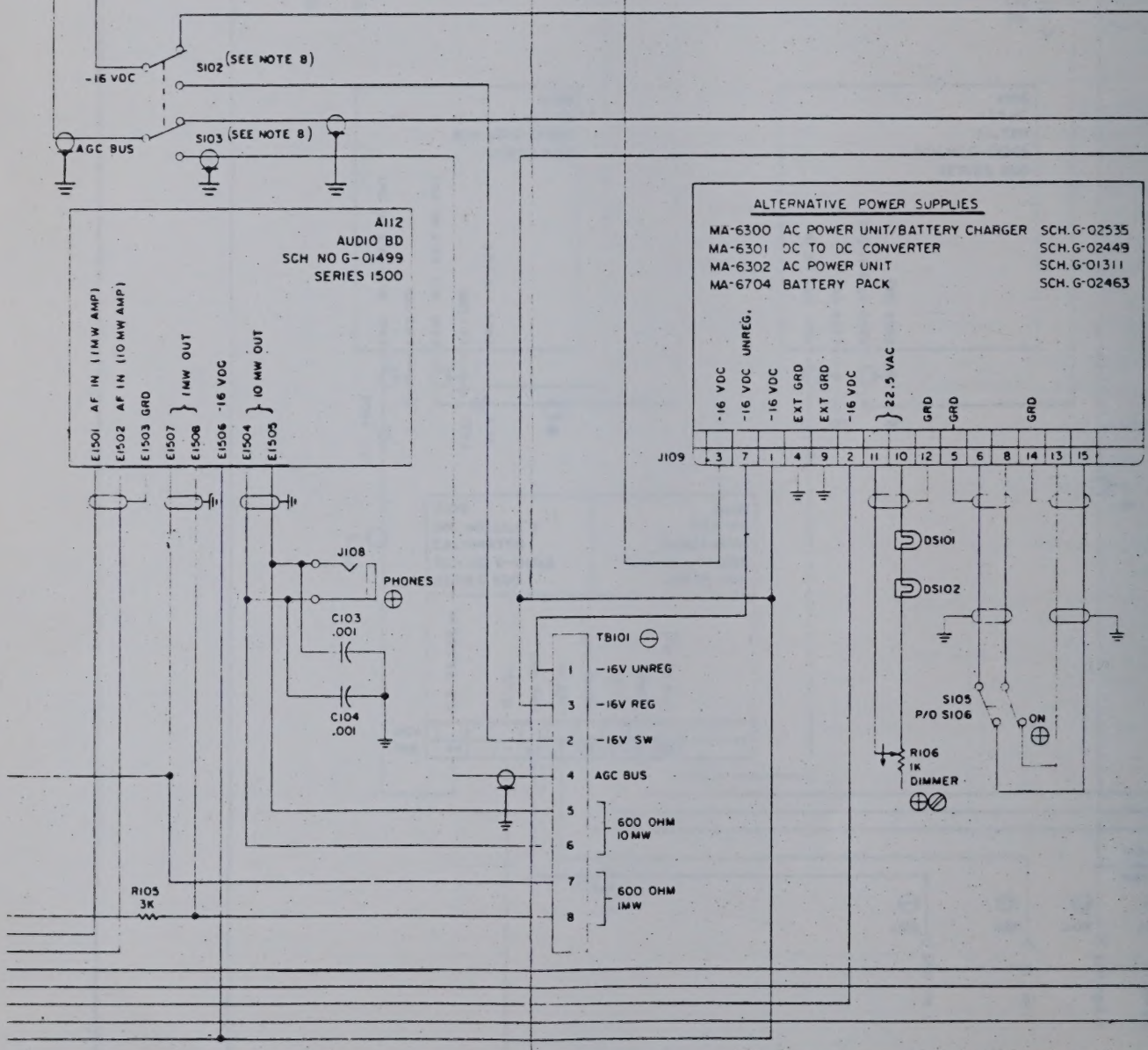
R11 1K
R12 1K
R13 12K
R14 22K
R15 39K
R16 39K
R17 8.2K

A3202
EF & METER ZERO
SCH NO G-01758
SERIES 1900
METER ZERO E1904

GND E1902
AF OUT E1901 (EF)
E1903 AF IN
E1909 GRD
E1908 -16 VDC
E1905 AF OUT (EF)
E1906 GRD
E1907 -16 VDC (DECOUPLED)

R18 1K
R19A 500
IF GAIN
C1 .001
R20 10K
AF LEVEL
R19B 10K
AF GAIN

S104
RF LEVEL
AF LEVEL
M101
CR101
R105 3K


-16 VDC
S102 (SEE NOTE 8)
AGC BUS
S103 (SEE NOTE 8)
A112
AUDIO BD
SCH NO G-01499
SERIES 1500
E1501 AF IN (1MW AMP)
E1502 AF IN (10 MW AMP)
E1503 GRD
E1507
E1508 1MW OUT
E1506 -16 VDC
E1504
E1505 10 MW OUT
ALTERNATIVE POWER SUPPLIES
MA-6300 AC POWER UNIT/BATTERY CHARGER SCH. G-02535
MA-6301 DC TO DC CONVERTER SCH. G-02449
MA-6302 AC POWER UNIT SCH. G-01311
MA-6704 BATTERY PACK SCH. G-02463
-16 VDC
-16 VDC UNREG.
-16 VDC
EXT GRD
EXT GRD
-16 VDC
22.5 VAC
GRD
GRD
GRD
J109
3 7 1 4 9 2 11 10 12 5 6 8 14 13 15
J108
PHONES
C103 .001
C104 .001
TB101
1 -16V UNREG
3 -16V REG
2 -16V SW
4 AGC BUS
5
6 600 OHM 10 MW
7
8 600 OHM 1MW
R103 3K
DS101
DS102
S105 P/O S106
ON
R106 1K DIMMER